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ABSTRACT

This collection of papers on HIV/AIDS prevention and education in rural communities includes: "Understudied HIV/STD Risk Behaviors among a Sample of Rural South Carolina Women: A Descriptive Pilot Study" (William L. Yarber, Richard A. Crosby, and Stephanie A. Sanders); "Risk and Co-Factors among Women Related to HIV Infection and AIDS Treatment" (Nancy T. Ellis); "Management of the Care of HIV-Infected Pregnant Women" (James G. Anderson, Marilyn M. Anderson, Linda L. Casebeer, and Robert E. Kristofco); "A Longitudinal Study of HIV/AIDS Related Mortality among African American and Hispanics in Texas During 1997" (Dennis Daniels and Haydee Encarnacion); "Perceived Behavioral Control for HIV/STD Prevention among African-American Undergraduate Students" (Andrew J. Kanu and Caroline G. Kanu); "Psychosocial Distress among Gay and Bisexual Men Living with HIV/AIDS in Small U.S. Towns and Rural Areas" (Timothy G. Heckman and Jeffrey G. Miller); "Rural and Non-Rural Adolescents' HIV/STD Sexual Risk Behaviors: Comparisons from a National Sample" (Richard A. Crosby, William L. Yarber, Kele Ding, Ralph DiClemente, and Brian Dodge); and "Family Physicians' Knowledge, Attitudes, and Practices Regarding HIV/AIDS Prevention" (Mohammad R. Torabi, Sandra Aguillon, and Ifeng Jeng). (Papers contain references.) (SM)

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The Health Education Monograph Series

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Foreword

I am delighted to present to you the fourth special issue of the **Health Education Monograph Series** on *HIV/AIDS Education and Prevention in Rural Communities*.

This publication deals with very timely topics related to HIV/AIDS Education in Rural Communities. The Rural Center for AIDS/STD Prevention is a joint project of Indiana University and Purdue University under Senior Directorship of Professor William Yarber. I want to offer special thanks to Pegasus Satellite Television* whose donation made possible the production and distribution of this issue to the entire membership of the National Health Education Honorary. An additional 3,000 copies have been disseminated by the Center. I would like to extend my utmost appreciation to the authors who worked diligently to make this additional publication a reality.

The scope of this special issue is broader and includes results of studies and pedagogical works that were not necessarily sponsored by our Rural Center. Included in this issue are various resarch and education projects dealing with different dimensions of HIV/STD prevention in rural communities. This issue covers topics related to HIV/AIDS and women, minorities, rural and non-rural residents, and gay and bisexual men.

The AIDS epidemic has given a new challenge to scientists in all disciplines and accentuates the notion of prevention through education and community empowerments. While some highly urbanized communities received more attention and resources for combating prevalence of HIV/AIDS, the rural communities have been relatively ignored. That is why the incidence of HIV/AIDS infection is growing fast in rural communities. Our Center is practically the only educational and research center that has concentrated its efforts in focusing on prevention of HIV/STD in rural communities.

On behalf of the National Executive Committee of Eta Sigma Gamma, I welcome professional organizations, research, and educational centers to consider sponsoring a special issue of ***The Health Education Monograph Series*** for future publications related to health education. Additional issues will receive full editorial process employed for production of our regular monograph series. As the editor of the Monograph Series and Co-Director of the Rural Center for AIDS/STD Prevention, I am delighted that the Center, through a grant from Pegasus Satellite Television, sponsored the fourth issue.

I would like to thank Ms. Kathy Finley for her assistance in preparing the publication and Ms. Joyce Arthur for her technical assistance. Also, the assistance of Mr. Jay Javed from our National ESG office is appreciated. Last, but not least, I would like to offer my appreciation to each and every member of the National Executive Committee who are very committed to supporting these monograph series.

Finally, thank you for sharing your comments with me regarding the past Monograph Series. As always, I am eager to hear your criticisms, comments, and suggestions regarding these publications. Your input is essential in improving the publication and ultimately serving our members and the profession in the most effective way. I do hope that you, as loyal members of this National Professional Health Education Honorary, check your college/university libraries and make sure that they receive ***The Health Education Monograph Series***. If not, please request that they subscribe to this important publication by calling 1-800-715-2559. It is a privilege for me to serve the Eta Sigma Gamma members and our profession.

I look forward to hearing from you.

Mohammad R. Torabi, PhD,MPH,CHES
Editor, ***The Health Education Monograph Series*** and Co-Director of the Rural Center for AIDS/STD Prevention

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Table of Contents

Volume 18, Number 1 2000

Understudied HIV/STD Risk Behaviors Among A Sample of Rural South Carolina Women: A Descriptive Pilot Study	*William L. Yarber, Richard A. Crosby, Stephanie A. Sanders*	1
Risks and Co-Factors Among Women Related to HIV Infection and AIDS Treatment	*Nancy T. Ellis*	6
Management of the Care of HIV-Infected Pregnant Women	*James G. Anderson, Marilyn M. Anderson, Linda L. Casebeer, & Robert E. Kristofco*	16
A Longitudinal Study of HIV/AIDS Related Mortality Among African American And Hispanics In Texas During 1997	*Dennis Daniels Haydee Encarnacion*	23
Perceived Behavioral Control for HIV/STD Prevention Among African-American Undergraduate Students	*Andrew J. Kanu, Caroline G. Kanu*	27
Psychosocial Distress Among Gay and Bisexual Men Living with HIV/AIDS in Small U.S. Towns and Rural Areas	*Timothy G. Heckman, Jeffrey G. Miller*	39
Rurual and Non-Rural Adolescents' HIV/ STD Sexual Risk Behaviors: Comparisons From A National Sample	*Richard A. Crosby, William L. Yarber, Kele Ding, Ralph DiClemente, Brian Dodge*	45
Family Physicians' Knowledge, Attitudes, and Practices Regarding HIV/AIDS Prevention	*Mohammad R. Torabi Sandra Aguillon Ifeng Jeng*	51

Understudied HIV/STD Risk Behaviors Among A Sample of Rural South Carolina Women: A Descriptive Pilot Study

William L. Yarber, H.S.D., Richard A. Crosby, Ph.D., & Stephanie A. Sanders, Ph.D.

Abstract

This descriptive pilot study determined the prevalence of understudied HIV/STD risk behaviors among a sample of rural women from South Carolina. The sample, which was randomly selected and telephone interviewed, was limited to 328 females, 18-39 years old, who reported that they had sex (vaginal, anal, or oral) with a male in past year. About 7% reported more than one sex partner in the past year. When asked about a typical four week period in the past twelve months, 4.2% reported having anal sex, 40.8% reported having oral sex, 20.3% reported having sexual intercourse during menses, 36.3% reported having sexual intercourse with poor lubrication, and 4.8% reported having "dry sex," (deliberately drying the vaginal before intercourse) all without a condom. In addition, 44.1% reported douching during a typical four week period in the past year. About 45% reported two or more risk behaviors and about 20% reported three or more risk behaviors. Nine women reported being diagnosed with an STD infection in the 12 months. Women reporting more risk behaviors were more likely to report an STD infection ($p < .01$). Overall, the study revealed that many of these rural women were at risk for acquiring HIV/STD from a male partner because they practiced risk behaviors. HIV/STD prevention education for rural women should discuss all types of risk behaviors.

Introduction

Women having sex with men are at risk for acquiring HIV/STD (Padian, 1997; Eng & Butler, 1997). Women with multiple male sex partners have a particularly high risk of becoming infected with an HIV/STD. However, women with only one male sex partner may also be at risk because their partners may have other partners. For example, using nationally representative data, Finer and colleagues (1999) found that one-fifth of sexually active women were at risk for HIV/STD because their males partners had two or more sexual partners, and that many of these women did not use condoms. Further, many of these women did not know that their partners also had other partners.

In addition to the risks of unprotected vaginal intercourse, women may also acquire HIV/STD from anal receptive sexual intercourse, (Vittinghoff et al. 1999), from unprotected oral sex (Vittinghoff et al. 1999; Tice & Rodriquez, 1981; Koutsky & Kivat, 1999; Jones, et al. 1985), and from unprotected vaginal intercourse during menstruation (Tanfer & Aral, 1996; Kassler & Aral, 1995; Malamba, Wagner, & Maude, 1994). The risk of HIV/STD to women practicing unprotected vaginal sexual intercourse increases if the vagina is poorly lubricated, causing inflamation and irritation (Bancroft, 1990; Holmberg, Horsburgh, Ward, & Jaffe, 1989). An extreme form of poor vaginal lubrication is the practice of "dry sex" (using a chemical or an object to deliberately dry the vagina before intercourse). Dry sex is a common practice among women in at least three African countries (Beksinska , Rees, Kleinschmidt, & McIntyre, 1999; Brown, Ayowa, & Brown, 1993; Civic & Wilson, 1996) and is less common among United States women (Foxman, Aral, & Holmes, 1998). Women who practice vaginal douching are also are greater risk of HIV/STD (Scholes et al, 1993; Levine, Pope, & Farshy, 1995; Wolner-Hanssen, Eschenbach, & Paavonen, 1990). The prevalence of these risk behaviors among women has not been adequately studied.

Foxman and colleagues (1998) assessed the frequency of these understudied behaviors among an urban sample (Seattle, Washington). However, no similar study has been conducted among rural women. This descriptive pilot study determined prevalence of understudied risk behaviors for HIV/STD infection among a sample of rural South Carolina women.

Methods

Data Collection

We selected South Carolina because it is a predominately rural state, with high rates of HIV/STD incidence. In 1997, South Carolina reported more cases of gonorrhea and chlamydia than any other state or territory and the fourth highest number of primary and secondary syphilis cases (Centers for Disease Control [CDC], 1998a). From July 1997 to June 1998, South Carolina reported the eleventh highest rate of AIDS cases in the United States, with the rate being higher for women than men (CDC, 1998b). Four predominately rural South Carolina counties (Chesterfield, Florence, Lancaster, & Marion) were selected for the survey based on surveillance data showing relatively high rates of syphilis infection in these counties, a marker of high-risk sexual behaviors and elevated rates of other STDs (CDC, 1998a).

A telephone survey was conducted from February to July of 1999 by the Center for Survey Research at Indiana University. Genesys random digit dialing, list-assisted sampling method (Genesys Sampling System, 1994) and computer-assisted survey software (University of California Computer-Assisted Survey Methods) were used to complete 328 interviews. To be eligible, women must have met the following eligibility criteria: 1) reporting vaginal, anal, or oral sex with at least one male sex partner in the past year; 2) 18 to 39 years of age; and 3) having primary residence in the household contacted. At each household, a respondent was randomly selected to be interviewed from all females 18 to 39 years of age. Calls were made during the morning, afternoon, and evening hours, except on Sundays, when calls were made only in the afternoon and evenings. At least 8 attempts, using different calling times, were made before giving up. Of eligible women, 344 refusals were recorded, yielding a cooperation rate of 49% (n = 328).

The data collection staff included five supervisors and 22 female interviewers. Each interviewer received 15 hours of general training in telephone interview techniques plus an additional three hours of training specific to the interview protocol used for this study. Interviewers were instructed to use non-judgmental probes and feedback phrases. To insure fidelity to the protocol, audio and visual monitoring of the interviewers was conducted by supervisors periodically but without the time of monitoring being known to the interviewer. Once the subject eligibility was established, 8 questions were asked resulting in the average length of a completed interview being 5 minutes. Informed consent was obtained before the interview and all research procedures were approved by the Human Subjects Committee at Indiana University.

Interview Questionnaire

The questionnaire assessed the number of male sex partners reported by women for the past year. Five items assessed sexual behaviors without condom use during a typical month in the past year: anal sex, oral sex, sexual intercourse during menses, sexual intercourse with poor lubrication, and dry sex. Frequency of douching during a typical month in the past year was also assessed. In addition, subjects were asked if they were diagnosed with an STD in the past year. Women were informed that vaginal intercourse is when a man's penis is inside a woman's vagina, anal intercourse is when a man's penis is inside his partner's anus, and oral sex is when a person's mouth is touching the partner's genitals. Women were also told that dry sex involves using something to deliberately dry up the vagina before sexual intercourse.

Data Analysis

Data were interpolated for those women providing a range of responses to any given item (e.g., responding by saying "3 or 4 times," instead of giving a single value). The number and percent of women reporting each of the risk behaviors and the number and percent reporting one, two, three, four, five, six, or all seven risk behaviors were generated. An independent groups t-test was conducted to compare the mean number of risk behaviors between those reporting and not reporting an STD diagnosis in the past year. Data were analyzed using SPSS software, version 9.0. Alpha was set at .05.

Description of the Sample

The mean age of the sample was 31.7 years (SD = 6.0). Twenty-three percent of the sample resided in Florence County, 32% resided in Chesterfield county, 28% resided in Lancaster county, and 17% resided in Marion county.

Results

About nine out of ten women (92.9%) reported sex with only one male partner in the past year, 3.4% reported two partners, 1.8% reported three partners, and 1.8% reported more than three partners (see Table 1). Nine women (2.7%) reported being diagnosed with an STD in the past year.

Table 1. Percent and Number of Rural South Carolina Women Reporting Multiple Sex Partners in the Past Year (N=328).

Number of Partners[a]	Percent	Number
2	3.4	11
3	1.8	6
4	.9	3
5	.6	2
6 or more	.6	2
Total	7.1	24

[a]Involving vaginal or anal intercourse or oral sex.

Table 2 displays the number and percent of women reporting HIV/STD risk behaviors. About four out of ten women reported oral sex without condom, vaginal sex with poor vaginal lubrication without a condom, and douching. About one-fifth reported vaginal sex during menses without a condom. Less than 5 percent reported anal sex or dry sex without a condom.

Table 3 displays the number and percent of women reporting multiple risk behaviors. About eight out of ten women reported at least one risk behavior during a typical month in the past year. Nearly one-half of women reported at least two risk behaviors and about one-fifth reported three or more risk behaviors during a typical month in the past year.

The mean number of reported risk behaviors for women reporting an STD diagnosis was 2.8 (SD = 1.3). The mean number of reported risk behaviors ($\underline{M}$ = 1.5, SD = 1.2) was lower for women not reporting an STD diagnosis ($t = 3.1$, $p < .01$).

Discussion

This descriptive pilot study found that many of the women surveyed were at risk for acquiring HIV/STD from a male partner because they engaged in risky behaviors without condom use. Even though few women had more than one sex partner, many reported behaviors, such as sexual intercourse with poor vaginal lubrication and intercourse during menses without condom use, that could expose them to HIV/STD if their partner were infected. Many women acquire HIV/STD not so much because of having multiple partners themselves, but from an infected male partner (Bunnell et al, 1999). Provided that the findings of Finer and colleagues (1999) generalize to our sample, a substantial portion of these rural women were at risk for HIV/STD infection because their male partner might have other partners. The findings also provide some evidence that these addi-

Table 2. Percent and Number of Rural South Carolina Reporting HIV/STD Risk Behaviors During a Typical Month in the Past Year (N=328).

	Number of Times						
Behavior	**1**	**2**	**3**	**4**	**5**	**6 or more**	**Total**
Anal Sex, no condom[a]	1.5% (5)	1.5% (5)	.3% (1)	.3% (1)	0% (0)	.6 %(2)	4.2% (14)
Oral Sex, no condom[a]	4.0%(13)	7.0%(23)	8.8%(29)	4.6% (15)	4.0%(13)	12.4%(40)	40.8%(133)
Coitus during menses, no condom[a]	6.5%(21)	4.0%(13)	3.7%(12)	1.5%(5)	1.5%(5)	3.1%(10)	20.3%(66)
Coitus with poor lubr., no condom[b]	6.7%(22)	6.4%(21)	2.4%(8)	3.7%(12)	5.2%(17)	11.9%(38)	36.3%(118)
Dry sex, no condom[a]	2.1%(7)	.9%(3)	.6%(2)	.3%(1)	0%(0)	.9%(3)	4.8%(16)
Douching	18.6%(61)	13.1%(43)	3.0%(10)	5.2%(17)	.9%(3)	3.3%(11)	44.1%(145)

[a]With a male sex partner.

Table 3. Percent and Number of Rural South Carolina Women Reporting Multiple HIV/STD Risk Behaviors During a Typical Month in the Past Year (N=328).

Number of Risk Behaviors[a]	Percent	Number
One	37.5	123
Two	25.3	83
Three	13.4	44
Four	3.4	11
Five	2.7	9
Six	.3	1
Seven	0	0

[a]More than one sex partner, anal sex with no condom, oral sex with no condom, coitus during menses with no condom, coitus with poor vaginal lubrication with no condom, dry sex with no condom, and douching.

tional, understudied risk behaviors are associated with STD incidence among rural women.

When the results are compared to similar findings of the study conducted by Foxman and colleagues (1998) the percentage participating in specific risk behaviors was seemingly slightly lower for this rural sample as contrasted to the Foxman urban sample. For douching, 44.1% of the present sample participated at least once in the behavior during the past month compared to 47% of the Foxman sample. For anal sex and dry sex during the past month, 4.2% and 4.8%, respectively, of this sample participated in the behavior at least once compared to 5.5% and 11% , respectively, of the urban sample. The comparison of the results for anal sex and dry sex is limited, however, as the present study asked the frequency of these behaviors without condom use, whereas the Foxman study (1998) did not ask whether or not a condom was used.

If we had only used conventional risk variables (i.e. unprotected vaginal intercourse and injecting drug use), the findings may have underestimated the HIV/STD risk-level among women in this study. Thus, our findings indicate these additional, understudied risk behaviors may be important to include in research of women's risk behavior in order to obtain a more accurate estimate of their HIV/STD risk. Further research could compare the frequency of unprotected vaginal sex to the frequency of the understudied risk behaviors, as well as determine the correlates associated with these risk behaviors.

The findings are limited by the validity of the self-reported data: under-reporting and/or over-reporting may have occurred. In addition, a selection bias may have occurred in that only about one-half of the eligible women completed the telephone survey. Given the highly personal nature of the questions asked, the participation rate in this study may have been as high as could be expected. However, this descriptive pilot study did indicate that many women were willing to disclose very personal information over the telephone for research purposes.

The findings of this study suggest that HIV/STD prevention efforts for rural women should include information about the value of condoms for HIV/STD protection during varied types of sexual risk behavior and the increased risk associated with poor vaginal lubrication during vaginal intercourse and douching. These intervention programs should also teach skills women need to negotiate condom use with their male partners. Condom promotion programs are especially important for women with at-risk male sex partners. Based on the Finer and colleagues (1999) study results, women should be informed they may be at risk for HIV/STD because their male partners have other sex partners.

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Risks and Co-Factors Among Women Related to HIV Infection and AIDS Treatment

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Abstract

Gender differences lie at the heart of risk of HIV infection and AIDS survival among women in the United States. In addition to the major risk factors of unprotected sex and injection drug use, there are many co-factors that increase transmission of, or susceptibility to, HIV in women: alcohol, non-injection drug use, other sexually transmitted diseases, and gynecological infections. Co-factors that decrease a woman's quality of life or AIDS survival time include rural primary health care limitations, inexperienced health care providers, caregiver responsibilities, male derived treatment guidelines, and lack of women in clinical trials. Many women bear the burden of HIV risk prevention by economic reliance on public assistance programs and male primary partners. Federal agencies, policy makers, researchers, public health practitioners and health educators must transfer their acknowledged cultural and gender sensitivity into respective competence and practice. Before intervention, there must first be an interdisciplinary holistic examination of the gender based roots of problems that underlie women's cognitive decisions to engage in risk behaviors and other co-factors relative to HIV infection and HIV/AIDS managed care.

Studies indicate that women consider themselves to be at no or lesser risk for HIV/AIDS than men. Mis-perceptions abound that this disease is primarily one of gay and bisexual men, or at the most, of injection drug users, prostitutes, or inner urban residents (Bernard & Prince, 1998; Sobo, 1995; Institute of Medicine (1997). Furthermore, there is neglect of gender specific issues pertinent to women in the prevention and treatment of HIV disease. Attention to women in the AIDS epidemic has primarily focused on women as vectors of transmission to men and children, not as a population who are themselves victims of HIV transmission and AIDS (Marte & Anastos, 1990). The reality of AIDS and its incidence and prevalence among women is apparent in the epidemiological data.

Aids Incidence and Prevalence Trends Among Women

Incidence of AIDS

Women account for a steadily increasing proportion of AIDS cases. AIDS incidence in women rose steadily through 1993 when the expanded case definition was implemented. Between 1986 and 1998 the number of new AIDS cases in women more than tripled from 7% to 23% (Centers for Disease Control & Prevention[CDC], 1986; CDC, 1999). Between 1991 and 1995 the number of women in this country diagnosed with AIDS increased by more than 63% (Lee, 2000). Of those cases reported in women in 1998, 55% are young women between the ages of 13 and 19 (CDC, 1999).

Since 1995, an average of approximately 12,500 cases of AIDS have been diagnosed in women each year. Annual incidence of AIDS cases in women began to decline in 1996, largely due to the success of antiretroviral therapies. However, between 1996 and 1997, AIDS incidence decreased by 15% in the general population, but only decreased by 8% in women. This discrepancy may indicate gender differences in response to antiretrovial therapy or managed care (Lee, 2000; CDC, 1999). A third explanation may be related to the dearth of research on women with HIV/AIDS. The majority of funded dollars ear-marked specifically for women has been spent on perinatal transmission research. Resultant scientific advancements in the treatment of pregnant women and newborns have markedly reduced mother to child transmission from 27% to 5% in the United States (Conner, Sperling, Gelber, 1994; Ficus, Adimora, Schoenbach, 1996). According to recently revised prenatal HIV screening guidelines, universal HIV testing for pregnant women is to be incorporated into the panel of blood tests routinely conducted during pregnancy (CDC, 2000). Although very important, funded perinatal transmission research does not impact the majority of women who are HIV infected nor their AIDS survival issues (Lucey, 1997).

Women's Vulnerability to HIV

The World Health Organization has cited three major reasons for the sky rocketing HIV rates among women. Women are more vulnerable to HIV biologically, epidemiologically, and socially (World Health Organization [WHO] Report, 1993)

Biological Vulnerability

Biologically, semen contains a much higher concentration of HIV than does vaginal secretions (WHO, 1993). Further

more, female reproductive anatomy makes a woman more highly susceptible to contracting sexually transmitted diseases (STD's) in comparison to men. Men are exposed to organisms that cause STD's. Their genitals are external and susceptible to cold temperature, soap and water, thus creating a less than desirable environment for bacteria and viruses. Conversely, women are infused with STD causing organisms, and their vagina provides a warm and protective environment that allows invading organisms to multiply and flourish. (Healy, 1995). Given these biological differences, women are two to eight times more susceptible to contracting HIV during heterosexual intercourse than men (Worth, 1994; Lee, 2000, respectively).

Epidemiological Vulnerability

Epidemiologically, women are more vulnerable to HIV than men for several reasons. Women tend to have sex with, or marry, older men. Men are more likely to have had more sexual partners than women, and thus men are also more likely to be infected with HIV (WHO, 1993).

Proportionate decline in AIDS incidence and deaths have been smaller among women than men and among Blacks than Whites (Fleming et al., 2000). Women of color are at greater risk. Sixty two percent of women reported with AIDS in 1998 were Black, making them 20 times more likely to contract AIDS than White women. The rate of AIDS was 8.5 times higher among Hispanic women than White women. Together, Black and Hispanic women accounted for 81% of the AIDS cases among women in the United States (Lee, 2000). Also there is an increasing burden of HIV infection among Black women in the rural Southeast (CDC, 1999; Womack, et al.,1997).

Today, 25% of Americans live in rural areas and are less likely to use preventive services; 20% of the rural population was not insured in 1996 (U.S. Department Health and Human Services[USDHHS], 2000). Regardless of indicator used, men and women in rural areas have less than their metropolitan counterparts: e.g., per capita income, health status, access to health care services, level of education, and employment opportunities (Lam & Liu, 1994; Metropolitan Insurance Companies, 1997). Of significant note is that residents in rural areas perceive the seriousness of AIDS in their communities to be less than their urban counterparts (Torabi & Ding, 1997).

Inequalities in income and education are the underlying basis for many health disparities in the United States. The lifetime costs of health care for HIV/AIDS has increased to $150,000 or more per person (USDHHS, 2000,). Women in the United States overall have lower education and income status than males. Often they are dependent on a primary male partner or public assistance programs for support, such as welfare and Medicaid, of which recent reforms are reducing benefits to women and children (Bushy, 1998; Calder, 1998). Such dependence erodes a woman's control of decision-making with regard to disease prevention and access to health care. Given geographic locality and socioeconomic status related to gender, it appears being rural and being female implies added jeopardy concerning primary health care, inclusive of HIV prevention and AIDS treatment.

One of two central goals in *Healthy People 2010, Health Promotion and Disease Prevention Objectives of the United States*, is to "eliminate health disparities." Undoubtably, HIV/AIDS remains a serious health problem now disproportionately affecting women, especially women of color. (USDHHS, 2000).

Social Vulnerability

Socially, women are more vulnerable because they are expected to the more passive partner in sexual relationships (WHO, 1993). The degree of gender social roles (female submissiveness, expectations of male sexual activity/freedom and household position) vary according to cultural, racial, and religious heritage as well as within drug culture social networks. Women are more likely to be exposed to the presence of multiple partners through their primary male partner, and often a woman's sexual decision-making, (i.e., condom use and consensual intercourse), is compromised due to her social position (Basen-Enguist, Tortolero, & Parcel, 1997; Marin, Gomez, & Hears, 1993; Marin, Tschann, Gomez, & Kegeles, 1993; Rojas, 1997).

HIV High Risk Behaviors for Adolescent and Adult Women

Women are currently the fastest growing population in the United States infected with HIV. Not identifying with the high-risk groups, women are often unaware that they may be engaging in high-risk behaviors. Women frequently are not aware of what constitutes individual high-risk behaviors or are negligent to consider the behavioral histories of their partners. Women must realize it is high risk behaviors that place them in jeopardy of contracting HIV, not group membership (Alexander & LaRosa,1994). The two major risk behaviors associated with HIV in women are unprotected heterosexual activity and injection drug use. Contrary to popular notion, rural adolescents and adults are at a similar or higher risk for engaging in HIV risk behaviors as their urban counterparts. Unprotected heterosexual contact and alcohol and drug use contributing to sexual risks are corroborated in rural areas. (Boyd, 1998; Crosby, Yarber, & Kanu, 1998; Douglas, 1995; Durant, 1992; Sherwood-Puzzello, 1998; Torabi & Ahua, 1998).

Heterosexual Transmission

Heterosexual transmission accounted for 38% of AIDS cases among women in 1998 (CDC, 1999).And

just recently, of 12,991 females "ever classified as risk not identified" through 1998, 68% of them were reclassified as being HIV infected via heterosexual contact in comparison to 15% of the males reclassified via the same route (CDC, 2000). Hence, the number of women currently being infected through heterosexual contact has surpassed injection drug use. Women don't understand that in many cases, the risk factor is their partner. A study in Southeastern United States revealed that most of recently infected rural women acquired HIV through heterosexual contact (Dominguez, et al., 1996). Furthermore, according to the National Survey of Family Growth, low income women and non-Hispanic Black women had misinformation concerning both the transmission of HIV as well as a lack of knowledge concerning their higher risk for contracting HIV (McNally & Moser, 1991).

Traditionally, primary recommendations to avoid contracting HIV through heterosexual contact are abstinence or postponing sexual activity, and condom use, thus placing the burden of HIV prevention on the woman. A study examining power dynamics in relationships revealed that 83% of women had asked partners to use a condom; of those, 16% of partners had objected; 29% of those women whose partners objected consented to have unprotected sex within the last 30 days. The greatest predictor for consent to unprotected sex was the partner saying, "I love you" (Pequegnat, London, & Draper,1997). In a study of low-income women, women were unlikely to use condoms particularly if they were residing in rural communities, pregnant, or married/cohabiting with a primary male partner. One main reason cited for not using a condom was a belief that the male partner was not HIV infected or had tested HIV negative, thus implying the element of trust. Lower perceived risk of HIV is another variable for non-condom use (Crosby, Yarber, & Myerson,1999). Lack of access to, and incorrect and inconsistent use of, condoms is an issue for young females as well. Young females, some of whom are having sex with older males, have difficulty following through on condom use due to intimidation or threats of mistrust by their partners (USDHHS, 2000).

Research using focus groups found that barriers to HIV high risk women seeking reproductive health care and HIV prevention services include: the high cost of health care, perceived poor quality of care, experiences of stigmatization, geographic accessibility, fear of legal/social services or punitive actions, misperceptions about condom usage, and lack of male involvement (Olivia, Rienks, & McDermid, 1999). Thus, women's control over their lives and their ability to protect themselves from HIV infection, or to gain access to treatment, may be limited by economic, cultural, legal, religious, social, and/or power/control factors.

Injection Drug Use

Twenty-nine percent of AIDS cases among women in 1998 were attributed to injection drug use (CDC, 1999). Needle sharing may be due to economic constraints and fear of legal repercussions associated with possession of a syringe (Koester, 1994). Even if clean needles are provided, other variables may influence needle sharing. Studies using a social network perspective have found that the structure of social relationships provide opportunities as well as constraints for the network members that influence behavior (Auerbach, Darrow, & Curran, 1984; Friedman, 1995; Klovdahl,1985; Latkin, et al., 1995; Trotter, Bowen, & Potter, 1995). Hence, the social network of an injection drug user provides access to drugs, an acceptable environment to inject drugs, a valued ritual among insiders, as well as emotional and material support from members. However, within that same network may be pressure to share drugs and injection paraphernalia, thus increasing the risk of HIV (Neaigus, et al., 1994). Also addicted women may sell sex for drugs or shelter, and they may avoid seeking treatment for fear of arrest for illicit drug use or fear of losing custody of their children (Sterk, 1999). Therefore, reducing the incidence of HIV among women injecting drugs is a complex issue with physiological, sociological, psychological, economic and legal subelements.

Co-Factors to HIV Transmission

Co-factors to HIV/AIDS, include variables or behaviors that facilitate the transmission of HIV infection by increasing infectiousness or susceptibility.

Alcohol and Non-Injection Drug Use

Besides injection drug use, other forms of drug use and abuse indirectly contribute to HIV in women and possibly affect the progression time to AIDS. Eleven percent of 38% of women contracting HIV through heterosexual contact in 1998, reported sex with an injection drug user (CDC, 2000). Furthermore, gender-specific links among drug use, sexual behavior and HIV risks concerning women are also confirmed (Lambert, Ashery, & Needle, 1995). Table 1 indicates the relationship between women's drug use and having sex, or what might be better termed, "sex under the influence."

TABLE 1 Sexual Activity Within 1 Hour After Drug Use

Drug	Percentage of women who had sex within 1 hour
Alcohol	76.0
Marijuana	69.6
Cocaine	68.4
Heroin	48.8

As indicated in Table 1, many women engaged in sex within one hour after drug use. Alcohol use within one hour before sexual activity was most common, followed closely by marijuana and cocaine use. Sex within an hour after heroin use was much less common, due to psychopharmacological effects ("mellowing out") (Sterk, 1999). Table 2 presents the extent to which drug use in women caused them to be less selective with sexual partners.

TABLE 2. Percentage of Women Who Engage in HIV High-Risk Sexual Behaviors by Type of Drug (N=259)

Drug	Less careful in selecting sex partner	Less likely to use a condom	More likely to engage in "freaking"*
Alcohol	49.0	48.5	46.4
Marijuana	25.0	39.6	26.6
Heroin	33.8	32.4	33.8
Cocaine	53.0	46.5	50.5

Table 2 reveals that although cocaine ranks highest in terms of causing women to be less selective with sex partners, alcohol ranks highest in terms of woman being less likely to use a condom. Hence, alcohol use is a marker for high-risk sexual behavior both in terms of indiscriminate sex and sex without a condom (Sterk, 1999).

Although the Sterk study (1999) was conducted on urban women, other studies document similar risks for rural women. The prevalence rate for alcohol is similar in rural and urban United States areas (Leukefeld & Godlaski, 1997). A study involving women and crack cocaine indicated no significant differences in intervention efficacy between rural and urban drug using women. Results imply that the drug using subculture is fairly homogenous regardless of geographic region and there is a need for similar HIV prevention services in both rural and urban areas (Weatherby, et al., 1999). An assessment of HIV risk behaviors related to HIV seropositivity across the rural-urban continuum concluded the spread of HIV between areas and within areas is not associated to ecological site, but rather specifically correlated with the following risk factors: injection drug use, use of crack cocaine, exchange of sex for money, and rates of sexually transmitted diseases (McCoy, Metsch, McCoy, Weatherby, 1999). Graham, Forrester, Wysong, Rosenthat, & James, (1995) attributed the increase in rural HIV/AIDS cases to the interrelationships of injection drug use, heterosexual behavior, and sexually transmitted disease levels. Also dramatic elevated rates of HIV infection in rural Black women have been reported.

Other Sexually Transmitted Diseases (STDs)

The presence of other STDs substantially increases the likelihood of both transmitting and acquiring HIV. Among persons with STDs, the likelihood of HIV co-infection typically is high among persons with ulcerative STDs due to shared risk factors. There are reinforcing effects of ulcerative STDs and HIV infection on ulcer persistence and subsequent HIV transmission. (Fleming, Wasserheit, 1999, Wasserheit, 1992). An analysis of 30 studies containing HIV seroprevalence data in the United States concluded HIV seroprevalence is high among patients with syphilis (Blocker, Levine, & St. Louis, 2000). Two major studies reported an HIV/Syphilis co-infection rate of 18% (Rolfs, Joesoef, & Hendershot, 1997; CDC, 1996). Both genital herpes (HSV) and genital warts (Human Papillomavirus -HPV) are individual co-factors with HIV. They also increase the risk of cervical dysplasia and cervical cancer in women (Corey & Handsfield, 2000; Monroe, 1999; Cu-Uvin, Hogan, Warren, Klein, et al., 2000). The high incidence and prevalence of major non-ulcerative STDs, especially gonorrhea and chlamydia, among HIV-infected persons could be greater than the co-incidence with genital ulcer disease. Chlamydia is the most prevalent sexually transmitted disease among women of reproductive age. (Belongia, Danila, & Angamuthu, 1997; Diaz, Chu, Conti, 1994; Wasserheit, 1992).

Latex condoms, used consistently and correctly, are highly effective in preventing the transmission of HIV and other STDs (CDC Update, 1993). However, in females aged 18-44, their reporting of condom use by partners is 24% in urban areas versus only 18% in rural areas (USDHHS, 2000).

Vaginitis

Vaginitis is an inflamation of the vaginal mucous membranes. Major contributors to vaginitis include candida (yeast-type fungus), trichomonas (protozoa), and gardnerella vaginalis (bacteria). These conditions may be, but not limited to, early signs of HIV infection. They also can adversely affect women living with HIV/AIDS (USDHHS, 2000).

HIV positive women are more likely to have rectal and oral yeast colonization than HIV negative women, and women whose immune system is severely compromised (AIDS) are more likely to have vaginal yeast infections. Chronic yeast infections are due to resistant non-albicans strains attributed to FDA approved over-the-counter treatments, over use of prescribed single dose treatment, and antibiotic treatment for bacterial infections in the body (Monroe,1999-2000).

A range of 31-42% of HIV infected women experience bacterial vaginosis. The presence of bacterial vaginosis is known to increase the rate of sexual transmission of HIV in women by increasing rates of HIV replication. The risk of perinatal transmission can be doubled. Women with female sex partners were three times more likely, and women with male partners were 1.7 times more likely to have bacterial vaginosis than women without partners (Monroe,1999-2000 & Alexander and La Rosa, 1994).

Trichomoniasis ("Trich") is usually sexually transmitted and requires treatment for both partners. There is an incidence of 10-17% in HIV-infected women with half of the women being asymptomatic. Left untreated, Trich can progress to the upper reproductive tract causing pelvic inflammatory disease (Monroe,1999-2000).

Co-Factors Impairing Response to Managed HIV/AIDS Care

Co-factors, for the purpose of this article, are defined as less than desirable variables that co-exist during HIV/AIDS secondary and tertiary interventions for women. These variables adversely affect the female patient's quality of life, progression time to AIDS, and AIDS survival time. The primary care setting, the female patient's social responsibility, and her gender based biological responses are implicated in her response to HIV/AIDS managed care.

Primary Health Care Limitations in Rural Areas

In rural areas, concerns of community stigma attached to HIV diagnosis, maintaining secrecy and confidentiality, insufficient financial resources, and fear of loss of social support may be more pronounced, especially in women. (Heckman, et. al., 1998, Rounds, Galinsky, & Stevens, 1991). These concerns are compounded with additional unique obstacles that rural residents must confront to access health care in comparison to their urban counterparts: under served pharmaceutical care (Gangeness, 1997), geographic dispersion of health care/provider services, lack of personal or public transportation, limited range of health services, and shortage of medical and mental health practitioners. Such factors not only impact physical health, but also emotional and psychological well-being. Rural residents have significantly higher problem severity ratings concerning health care than urban patients (Heckman, et al., 1998; Humphreys & Rolley, 1998). In a rural outpatient primary care study, functional impairment was explained more by psychological distress than by severity of chronic medical illness (Thurston-Hicks, Paine, & Hollifield, 1998).

Caregiver Role and Delay of Treatment for HIV/AIDS

Of the U.S. women with HIV or AIDS, more than half of them have dependent children 16 years of age or younger (Schable, Diaz, & Chu,1995). Also, about three-fourths of informal care-givers of the elderly at home are women. For rural and urban HIV positive women alike, delays in seeking care or lack of acquiring their own HIV/AIDS treatment, is attributed to their caregiving role (Harrington, et al., 1996; Stone, Cafferata, & Sangle, 1987). Women have a difficult transition from primary caregiver to carereceiver (patient). Delays in seeking HIV care due to competing caregiver responsibilities were reported to be 1.6 times greater for women than for men (Stein, et al., 2000). Being female and having a child in the home were both predictors of delaying HIV care. Women with symptomatic HIV lived more often with children than did the men, were more likely to assume care for children, and expressed worry about losing their children. Unmet emotional support need was approximately 50% greater for symptomatic HIV women than men (Crystal, Dermatis, & Sambamoorti, 1995).

HIV diagnosis among women with children has been attached to significant social stigma , guilt of transmission or leaving surviving children, depression, lack of social network support in comparison to non-positive mothers, and despair issues that impact their parental care giving as well (Hackl, Somlai, Kelly, & Kalichman, 1996; O'Leary, Wadhwani, Gebelt, & Frenkel, 1995; Walssek, Higham, Zwerski, & Townley, 1995). Another gender related caregiver issue is older women (grandmothers) who become surrogate parents to children orphaned from the AIDS epidemic. Older women confront other chronic illnesses such as diabetes, heart disease, and obesity. How surrogate parenting in late life affects the health of older caregivers and children in their care is an issue of increasing concern (Joslin & Brouard, 1995).

Health Care Provider Experience

Of utmost importance, experienced HIV/AIDS health providers may be lacking in smaller communities, thus impacting survival after AIDS diagnosis. Rural health providers seeing fewer HIV/AIDS patients may also be less aware of gender specific manifestations of HIV/AIDS in women, as well as needs of services relating to women's role in family (child care, linked adult and pediatric treatment, temporary foster care, and counseling for surviving children) (Frank, Blundo, & Brabant, 1995). In a study of survival after AIDS diagnosis, 73% of women with AIDS receiving care in high experience clinics survived 21 months after AIDS diagnosis in contrast to a 53% survival rate of women in low experience clinics, thus confirming the relationship between provider HIV experience and outcome. HIV positive women have a 50% increased survival rate if they experience care at an experienced clinic instead of one with less HIV experience (Laine, et al., 1998).

Gender-Related Response to Antiretroviral Therapy

Women with HIV/AIDS may physiologically respond differently to antiretroviral drugs than do men. There are three criteria that health care providers use to determine treatment for HIV positive patients: clinical disease (sickness related to HIV), viral load, and T-cell count. Recent research suggests that there are gender differences in three areas related to HIV: viral load, T-cell counts in persons with or without HIV, and the level of T-cell counts at which AIDS develops. Also, T-cells may fall more slowly in Black and Hispanic women compared to White women. (Frazadegan, Hoover, Astemborski, Lyles, et al., 1998).

The amount of virus an HIV positive person has in the blood, called viral load, determines the response to treatment. Lower viral load is associated with longer survival time. Research, however, suggests that viral loads tend to be lower in women compared to men (Katzenstein, Hammer, & Hughes, et al., 1996; Bush, Donovan, & Markowitz et al., 1996). A major study revealed that women, with half

the viral load of men, had a similar time to AIDS as men. Hence, whereas time to AIDS is similar for men and women univariately, proportional-hazards models show that women with the same viral load as men had a 1.6 fold higher risk of AIDS than men. Although the biological mechanism is uncertain, these findings suggest that current recommendations for HIV-1 viral load thresholds to begin antiretroviral therapy should be lowered for women. The possibility that women, according to current guidelines, may be under treated as a population, must be carefully evaluated (Frazadegan, Hoover, Astemborski, et al., 1998).

Treatment of drug using women diagnosed with HIV and AIDS is also an area in need of study. For example, in a prospective cohort study of HIV disease progression among drug users by gender, women experienced less AIDS-free time. Crack-cocaine use in women, but not in men, was associated with double the risk of developing AIDS (Webber, et al., 1998).

Clinical Trials and Research

Treatment of HIV and progression to AIDS uncertainties by gender lead to another concern, a disproportionate under enrollment of women and women of color in both government and pharmaceutical clinical trials (Moore, 1999-2000). The Public Health Service HIV guidelines (used to set a "standard of care" which physicians depend on to help them select the best treatment protocol for their patients) were developed on data mainly collected in studies of men. There is a dearth of research on antiretroviral drugs relative to toxicity, dosing, side-effects, and immunological responses specifically in women with HIV disease. Although the FDA now permits women to participate in clinical trials, contingent on the use of birth control, there are still structural and attitudinal barriers contributing to resistence of the National Institutes of Health implementation guidelines that encourage enrollment of women in clinical trials (Anastos, Denenberg, & Solomon, 1997).

Primary reasons women cited for not enrolling in clinical studies include: lack of information about clinical trials, lack of interest, and fear of side effects. The single most facilitating variable for those women who did participate in clinical trials was the support and/or recommendation of their health care provider. Health care providers cited barriers to participation in clinical studies to include gender issues, lack of knowledge about available clinical trials and lack of coordinated health services. Even though almost half of the providers considered their female patient to be a good candidate for a clinical study, only 14% presented that option to their patient. (Moore, 1999-2000; Edelstein & Jacobson, 1999).

Concluding Remarks: Interdisciplinary Collaboration and Ethnographic Research

Health education/promotion planning must not limit itself to HIV major risk factors, but also consider social network and other contextual variables that may be at the root of, or contributing factors to, HIV risk behaviors and noncompliance with HIV/AIDS treatment. Gender and cultural sensitivity transferred into practice requires professional competence. Health educators must diversify and expand their professional readings and research, encompassing not only pointed health science literature, but also broadening their depth of knowledge from sociological, anthropological, psychological, criminal justice, medical and gender-based literature. Cross-disciplinary and collaborative efforts could facilitate funding and holistic planning that yields multilevel research and prevention/intervention models for HIV/AIDS specific to women.

Currently, HIV/AIDS policy decisions and interventions are based largely on epidemiological indicators and structured needs assessments. Policy formulation and program development for HIV/AIDS interventions in women could benefit greatly from careful consideration of information obtained through gender based ethnographic research. This technique involves in-depth one-on-one interview techniques to collect data explicit on the meaning of events and actions, often in the respondent's cultural or social setting (Marcus & Fisher, 1986). Underlying co-factors relative to HIV transmission, risk behaviors and delay or noncompliance of HIV/AIDS managed care in women need to be identified and interpreted within the context of existing cultural, social, economic, and geographic settings. The identification and prioritization of HIV/AIDS needs, issues, and concerns of women by women themselves could provide meaningful insight for health educators, public health programmers and health care providers. For example, given the setting, some women may desire to focus on developing healthy sexual relationships, others may want to stop drug abuse or focus on anti-oppression strategies, and still others may desire care or counseling for their children during HIV/AIDS therapy.

Finally, for female patients with AIDS who are undergoing antiretroviral therapy with drugs that have not been studied on statistically significant numbers of women, there should be referral to appropriate clinical trials. Recruitment and retention of more women and women of color in clinical research is crucial to determine gender differences in delaying or preventing clinical disease and response to antiretroviral therapy. The recruitment of women for clinical trials necessitates the help of community based individuals and organizations, especially primary health care providers who are on the front lines of HIV/AIDS health care delivery.

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Management of the Care of HIV-Infected Pregnant Women

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Abstract

HIV/AIDS is the most severe health problem affecting women of reproductive age in the U.S. Almost 9 out of 10 women reported as HIV-infected in 1998 were of childbearing age. The prevalence of the disease in this population accounted for 91 percent of the pediatric AIDS cases reported by December 1998. Studies have found that women who are infected with the virus are more likely to receive inadequate or inappropriate care. In this study we constructed a computer simulation model of the management of care of HIV-infected pregnant women. The model was used to predict the effects of a continuing medical education program developed to improve physician management of pregnant women who are infected with the HIV virus. Major findings of the study suggest that improvements in physician management of HIV/AIDS could not only extend the lives of infected pregnant women but also could reduce the number of infants infected with the HIV virus and HIV-related deaths.

Introduction

The epidemic of human immunodeficiency virus (HIV) and acquired immune deficiency syndrome (AIDS) is the most severe health problem affecting women of reproductive age. Between 1991 and 1995, the number of diagnosed cases of AIDS among women increased by 63 percent (Wortley & Fleming, 1997). The rapid spread of the disease in this population is evidenced by the fact that adult and adolescent women accounted for 23 percent of the new AIDS cases and 32 percent of the new HIV cases reported (Centers for Disease Control and Prevention [CDC], 1998a). Heterosexual transmission of the virus is the major route of transmission accounting for 72 percent of HIV prevalence in 1993 (Rosenberg & Biggar, 1998).

Of the newly HIV-infected women, 88 percent of the cases reported through December 1998 were of childbearing age (CDC, 1998; Davis et al., 1998). As a result of the high prevalence of HIV in this population, vertical transmission of the HIV virus from mother to infant accounted for 91 percent of the 8,461 pediatric AIDS cases reported by December, 1998 (CDC, 1998a).

Recent advances in antiretroviral therapy have dramatically altered the management of patients infected with the HIV virus and consensus statements on management have followed (Carpenter et al.; CDC, b,c). Adherence to these guidelines has dramatically increased the life expectancy of infected persons (Fleming, Sweeney, Frey, Mays, & Ward, 1998; Palella, et al., 1998; CDC, 1998a).

In 1994 and again in 1998, the U.S. Public Health Service published guidelines on the use of zidovudine (ZDV) to reduce perinatal transmission of HIV (CDC, 1994, 1998c) and in 1995 published guidelines for counseling and voluntary testing of pregnant women (CDC, 1995). These guidelines are based on studies that demonstrated a 62-67 percent relative risk reduction in mother to infant transmission of the HIV virus when the guidelines are followed (Connor, et al., 1994; Frenkel, et al., 1995; Mandelbrot, et al., 1998). A four state study of the success in implementing these guidelines indicated that the proportion of pregnant women in whom HIV infection was diagnosed before giving birth increased from 68% in 1993 to 81% in 1996 (CDC, 1998d). Over this same period of time, the proportion of women in whom HIV was diagnosed who were offered prenatal ZDV increased from 27% to 85%.

The rate of infection with the HIV virus has been increasing. While it took eight years before the first 100,000 cases of AIDS were reported, it took only three more years for the reported number of AIDS cases in the U.S. to double (CDC, 1992). The rate at which the infection is spreading threatens to overwhelm subspecialists who are trained to care for HIV/AIDS-infected patients. Consequently, there is a need for large numbers of primary care physicians to provide care as well (Sadovsky, 1989).

Despite the dissemination of these guidelines, widespread variation in treatment continues to exist. One study assessed the educational needs of Oregon family physicians concerning HIV-related conditions (Darr & Sinclair, 1992). Family physicians were found to be comfortable in areas such as taking drug use and sexual histories, HIV testing, and counseling patients. They were much less comfortable in managing symptomatic patients. A second study of general internists and family practitioners examined their ability to recognize three common findings associated with HIV infection, namely, Kaposi's sarcoma, oral hairy leukoplakia, and diffuse lymphadenopathy (Paauw, Wenrich, Curtis, Carline & Ramsey, 1995). Primary care physicians frequently missed these three HIV-related physical findings and failed to make the appropriate diagnosis. As a result of this failure to diag-

nosis HIV infections, patients experience preventable morbidity and mortality.

Broad deficits in knowledge about the natural history and treatment of HIV infected patients exist among physicians and nurses as demonstrated by a study in a Minnesota public teaching hospital (Henry, Sullivan, & Campbell, 1993). The study concluded that the extensive professional knowledge and information concerning HIV/AIDS that has been disseminated might be overwhelming for clinicians making it difficult to identify relevant information. Moreover, many clinicians demonstrated a mistaken impression that advances in treatment only affect the length of survival of patients with HIV/AIDS. In reality, many of the advances in antiretroviral therapy are designed to delay the onset of AIDS and maintain the HIV-infected person in a disease-free state for as long as possible (Gail, Rosenberg, & Goedert, 1990). The results of another study indicate that health care workers who treat AIDS patients frequently encounter difficulties because of the rapid evolution of knowledge about the treatment of infected patients (Guise, et al., 1994). Information needed by these professionals fell into four categories: treatment protocols, diagnosis and etiology, complications, and adverse drug reactions. As a result, there may be a lag of as much as three years before patients of primary care physicians receive appropriate therapy (Markson, Cosler, & Turner, 1994).

Women who are infected with the HIV virus are more likely than men to receive inadequate or inappropriate treatment as shown by two studies. One cohort study examined variations in the care received by a national adult sample (Shapiro, et al., 1999). Interviews were conducted by the HIV Cost and Services Utilization Consortium at three points in time between January 1996 and January 1998. Access to needed care was determined by three measures of service and three measures of pharmaceutical utilization. The study found that access to care improved from 1996 to 1998. However, significant differences in care of men and women that existed at baseline in 1996 were still observed in 1998 at the second follow-up. Twenty-two percent of HIV-infected women had not received protease inhibitors or nonnucleoside reverse transcriptase inhibitor therapy by December 1998 compared to 13 percent of the HIV-infected men.

The second study examined physician practice patterns in the management of HIV/AIDS patients (Kristofco, et al., 1998). A sample of U.S. physicians who are members of the International Association of Physicians in AIDS Care was surveyed. Six case scenarios were used to represent management of HIV-infected patients who were treatment-naïve, treatment-experienced, and HIV-infected pregnant women. When presented with the case scenarios of treatment-naïve HIV-infected patients, 86 percent of the respondents were able to identify factors that should be considered before initiation treatment and 94 percent were able to identify the appropriate initial therapy. However, 67 percent of these physicians were able to identify the appropriate therapy for treatment-experienced patients while only 54 percent identified the appropriate antiretroviral therapy for treatment-naïve HIV-infected women.

An important consequence of physician lack of knowledge and experience with the treatment of HIV/AIDS-infected patients is increased mortality. A study at Group Health Cooperative of Puget Sound, a staff model health maintenance organization, found that the prognosis of patients diagnosed with AIDS was directly related to the experience of the physicians who manage their care (Kitahata, et al., 1996). The median survival of patients treated by physicians with the least experience with the management of AIDS was 14 months, compared with 26 months for patients treated by physicians with the most experience. For HIV-infected pregnant women, another major consequence of inadequate or inappropriate treatment is increased risk of perinatal transmission of the HIV virus to newborns (Anderson & Anderson, 1998).

The results of a large number of studies suggest that practicing physicians needs for information concerning the diagnosis and treatment of HIV/AIDS are not being met (Fournier, Baldor, Warfield, & Frazier, 1997; Jones, et al., 1992). Deficits in information exist regardless of physicians' backgrounds or clinical responsibilities (Guise et al.,1994). One study of family physicians found that respondents demonstrated a willingness to take advantage of educational opportunities to increase their knowledge of HIV-related issues (Darr & Sinclair, 1992). The purpose of this study was to predict the effects of a CME program designed to improve physician management of the care of HIV-infected pregnant women. It was hypothesized that CME programs that improved physician management of the care of HIV-positive pregnant women could extend the lives of the women, reduce vertical transmission of the HIV virus from mothers to their infants, and infant mortality from HIV-related causes.

Methods

A system dynamics model of the management of care for HIV-infected pregnant women was constructed using STELLA software (Hannon & Ruth, 1994). The model is shown in Figure 1 (Anderson, Anderson, Casebeer, & Kristofco, 1999). The number of HIV-infected women of childbearing age was estimated for each year. Based on assumptions about the life expectancy of women who are appropriately and inappropriately treated for the HIV infection, the number of maternal and infant HIV-related deaths were estimated. Parameter values used in the model are discussed below.

Table 1 provides the parameter values on which the estimates of the infection and mortality rates for women and infants were based. The incidence of HIV infection in women of childbearing age was based on the national population-based Survey of Childbearing Women. (Gwinn et al., 1991; Wortley & Fleming, 1997).

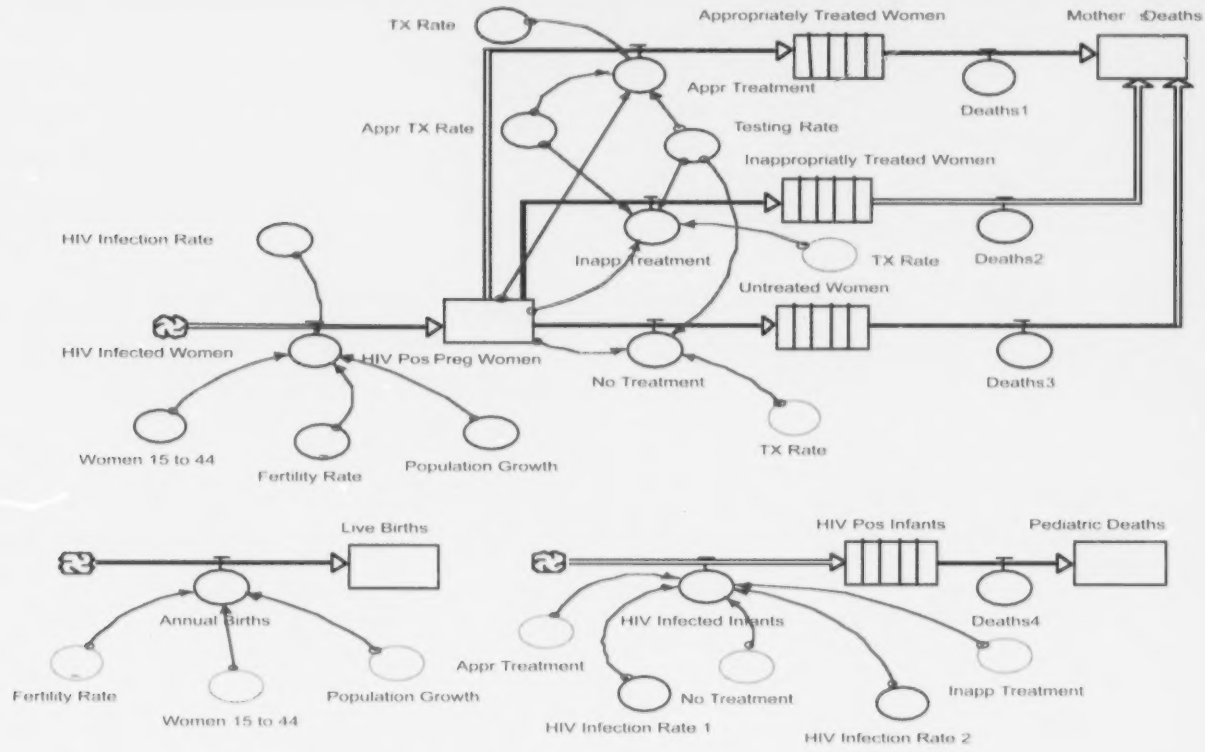

Figure 1 Management of the Care of HIV-Infected Pregnant Women

Estimates of the HIV infection rate among infants born to untreated HIV-positive women were based on findings from the Pediatric AIDS Clinical Trials Group Protocol 076 (Connor et al., 1994). The study found that 25.5 percent of infants born to untreated HIV-infected women were infected with the virus. Among treated HIV-infected pregnant women, the infection rate for newborns was 8.3 percent.

Table 1 also contains the parameters on which estimates of the effects of the management of care for HIV-infected pregnant women were based. One study of routine prenatal screening for HIV infection found that, when screening was offered with counseling, acceptance of testing by pregnant women increased from 77 percent to 90 percent (Barbacci, Repke, & Chaisson, 1991). The model assumed a testing rate of 77 percent. Also, it was assumed that 90 percent of the pregnant women who were found to be HIV-positive agreed to antiretroviral therapy.

Studies of the natural history of HIV/AIDS infections in adults have indicated that individuals who do not receive the recommended antiretroviral therapy will live 12 years, on the average, after becoming infected with the virus (Rutherford et al., 1990; Hellinger, 1993). It was assumed that women who receive the recommended therapy would live 18 years on average from the time of infection. The progression of the HIV disease in infants is much more rapid. Studies have found that 25 percent to 50 percent of HIV-infected infants develop AIDS within one year of becoming infected. Almost 80 percent of infected infants develop AIDS within three to five years (European Collaborative Study, 1994; Frederick, Mascola, Eller, O'Neil, & Byers, 1994; Hsia, Fleishman, East, & Hellinger, 1995).

The effects of three rates of appropriate treatment of HIV-infected pregnant women were examined. For the baseline, it was assumed that 55 percent of pregnant women were treated appropriately by their physicians (Kristofco et al., 1998). Estimates also were made based on the assumption that the CME program was successful in increasing the appropriate treatment of HIV-infected pregnant women to 65 percent and 75 percent. The period simulated was from 1995 to 2025.

Results

Tables 2 and 3 show the predicted number of pregnant women and newborn infants who will become infected with the HIV virus and HIV-related mortality rates. Over the 30-year period, the model predicts that 124,522 pregnant women in the U.S. will become infected. Assuming current patterns of treatment, almost 22,000 newborn infants will acquire the HIV virus from their mothers. The incidence of pediatric

Table 1. Parameter Values Used in the Simulation

Parameter	Value	
Women 15-44 (1995)	59,442,000	
Annual U.S. Population Growth Rate	0.27%	
Fertility Rate (Graph)	65.6–60.7/1000 Women 15-44 Years of Age	
HIV Incidence Rate	1.1/1000 Women 15-44 Years of Ag e	
HIV Testing Rate	77%	
Acceptance of Treatment Rate	90%	
Appropriate Treatment Rate	55% - 65% -75%	
Appropriately Treated Women Survival	Normal Distribution	M=18 yrs, SD = 1 yr.
Inappropriately Treated Women Survival	Normal Distribution	M=12 yrs, SD = 1 yr.
Untreated Women Survival	Normal Distribution	M=12 yrs, SD = 1 yr.
Infant Infection Rate – Appropriately Treated Women	8.3/100 Live Births	
Infant Infection Rate – Inappropriately Treated Women	25.5/100 Live Births	
Infant Infection Rate – Untreated Women	25.5/100 Live Births	
HIV-Positive Infant Survival	Normal Distribution	M=6yrs, SD = 1 yr.

HIV is 19 per 100,000 live births. A little over 50 percent of the women who become HIV-infected during this period of time will die from HIV-related causes, whereas, infant mortality from HIV-related causes is predicted to be 16 deaths per 100,000 live births.

Improvements in physician management of care for infected pregnant women would have a significant effect on mortality rates. The model predicts that if 75 percent of HIV-infected women were treated according to accepted standards for antiretroviral therapy, infected women's life expectancy would be extended. Over the 30-year period, 6,500 fewer women would die from HIV-related causes.

The hypothesized improvements in management of care would have an even greater effect on the health of newborn infants. The model predicts that the rate of vertical transmission of HIV virus from mothers to infants would be reduced to 17 per 100,000 live births. As a result, infant mortality rates from HIV-related causes would also decline to 14 per 100,000 live births. Over the thirty-year period there would be 2,300 fewer deaths due to pediatric HIV.

Discussion

There is evidence that preventable morbidity and mortality occur when individuals who are infected with the HIV virus are inappropriately treated. Women, especially those who are pregnant, are more likely to be inappropriately treated. A major consequence is an increase in the likelihood of vertical transmission of the virus from mothers to their infants. This problem stems largely from a lack of knowledge on the part of physicians of proper care management. A series of studies have found that the information needs of physicians who treat patients who are infected with HIV/AIDS are not being met.

Up-to-date treatment for HIV-infected patients offers longer term survival. However, treatment continues to evolve rapidly. Physicians and patients need to establish long-term relations where the patient's clinical status can be continually monitored and necessary modifications to therapy can be made. As new therapies become available, they need to be disseminated rapidly without the lag that has been ob-

Table 2. Incidence and Mortality from HIV among Pregnant Women 1995 -2025

Rate of Appropriate Treatment	HIV-Infected Women	HIV-Related Maternal Deaths	Mortality Rate per 100 HIV-Infected Women
55%	124,522	64,191	51.5
65%	124,522	62,009	49.7
75%	124,522	57,700	46.0

Rate of Appropriate Treatment	HIV-Infected Infants	HIV Incidence per 100,000 Live Births	HIV-Related Infant Deaths	Infant Mortality Rate per 100,000 Live Births
55%	21,891	19	18,321	16
65%	21,042	18	17,168	15
75%	19,629	17	16,016	14

served in the past in order to avoid unnecessary morbidity and mortality. This will require carefully designed CME programs. Physicians have indicated a willingness to participate in some CME activities such as hotline consults, one-day regional workshops, and the use of written protocols. However, they are less willing to utilize video and audio-tapes, teleconferences, and to attend longer university sponsored workshops (Darr & Sinclair, 1992)

The findings of this study suggest that carefully designed CME programs that improve physician management of the care of HIV-infected pregnant women can not only extend the lives of the women but can significantly reduce the rate of transmission of the HIV virus from mothers to infants. This study found that if, the percentage of HIV-infected pregnant women who were appropriately treated were increased from 55 percent to 75 percent, the life expectancy of these women could be significantly extended. Over the period from 1995 to 2005, 10 percent fewer pregnant women would die from HIV-related causes.

A secondary consequence of the improved treatment would be a decrease in the vertical transmission of the HIV virus from mothers to their infants. It is predicted that the incidence of pediatric HIV would decrease from a rate of 19 per 1000,000 live births to 17 per 100,000 live births over the period from 1995 to 2005. As a result, there would be 2,300 fewer infant deaths due to HIV-related causes during this period.

The analysis is based on several assumptions. It was assumed that over the 30-year period the incidence of HIV infection in pregnant women remained constant at 1.1 per 1000 women 15 to 44 years of age. If a reduction in new infections were to result from prevention efforts, the number of infected women and infants will be less than the numbers predicted in the present analysis. Second, the transmission rates of HIV from mothers to infants are based on current treatment protocols. In the future, advances in the treatment of pregnant women may reduce the vertical transmission rate. This would affect the estimates of the incidence of pediatric HIV and infant deaths due to HIV-related causes.

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A Longitudinal Study of HIV/AIDS Related Mortality Among African American And Hispanics In Texas During 1997

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Introduction

According to the Centers for Disease Control and Prevention [CDC] (1999), HIV/AIDS: Surveillance Supplemental Report, the data from prevalence surveys and from HIV and AIDS case surveillance continue to reflect the disproportionate impact of the epidemic on racial/ethnic minority populations, especially women, youth, and children. At the same time, prevalence surveys suggest that young men who have sex with men remain a population at high risk for HIV infection (CDC, 1998). Declines in AIDS incidence and deaths, first reported in 1996, continued through 1997 and provide evidence of the widespread beneficial effects of new treatment regimens (Anderson, Kochanek, & Murphy, 1997).

The proportion of different populations affected by HIV/AIDS has changed over time. In the United States, African Americans and Hispanics have been affected disproportionately by HIV and AIDS, compared to other racial and ethnic groups (Haverkos, H., Turner, J., Moolchan, E., & Cadet, J., 1999). Through December 1998, 688,200 cases of AIDS (United States Department of Health and Human Service, 1999) had been reported among persons of all ages and racial and ethnic groups, including 304,094 cases among Whites, 251,408 cases among African Americans, and 124, 841 cases among Hispanics. Although 55 percent of the reported AIDS cases occurred among African Americans and Hispanics, these two population groups represent an estimated 13 percent and 12 percent, respectively, of the total United States population.

Since at least 1989, rates of AIDS have been higher among Hispanics than among non-Hispanic Whites. In 1995, HIV infection remained the leading cause of death among Hispanics 25 through 44 years of age. HIV prevalence was higher in non-Hispanic blacks than in other racial/ethnic groups. Non-Hispanic blacks and Hispanics accounted for 47% and 20%, respectively (Diaz, Buehler, Castro, & Ward, 1995). The AIDS case rate among African Americans in 1998 was 66.4 per 100,000 persons, or eight times the rate for whites (8.2 per 100,000), and over twice the rate for Hispanics (28.1 per 100,000) (CDC,1998) .

Among women with AIDS, African Americans and Hispanics have been especially affected, accounting for nearly 77 percent of cumulative cases reported among women by 1998. Most women with AIDS were infected through heterosexual exposure to HIV, followed by injection drug use. Female adolescents and young adult women under 25 years of age are at higher risk for HIV/AIDS infection than older women (CDC, 1998).

The number of deaths related to HIV increased every year in the United States between 1980 and 1995 (CDC, 1997). The first decline occurred in 1996, followed by an even larger one in 1997 (CDC, 1998). However, enthusiasm for these marked declines in national HIV-related mortality, most likely resulting from access to primary care and combined therapies, has been tempered by disparities in these declines among various subpopulations (National Institutes for Health [NIH], 1997). In particular, there has been a discouraging lack of progress in declines among groups who are increasingly affected by HIV disease, i.e., women, adolescents, young adults, African Americans, Hispanics, and injection drug users (DeCock, 1998).

A comparison study of AIDS and HIV diagnoses from 25 HIV reporting states, during the years 1994-1997 (CDC, 1998), reported that the majority of infections were diagnosed among African Americans and Women. Of the 7,200 cases of HIV reported among persons 13 to 24 years of age from January 1994 to June 1997, forty-four percent (3,203) were female, 63% (4,566) were African American, and 5% (394) were Hispanic. In addition, AIDS incidence increased in all regions in the nation through 1994, with the most dramatic increases in the South. In 1996, AIDS incidence dropped in the Midwest (-10%), the West (-12%), and the Northeast (-8%), and leveled in the South (0%).

A longitudinal study in Texas during 1997 was devoted to examining HIV/AIDS related mortality among African American and Hispanics. This study was a descriptive analysis for 2,538 deaths in 1997 among people with AIDS in Texas. The purpose of the study was to describe the Texas HIV/AIDS-related mortality trends in 1997 (Texas Department of Health, 1997), with specific attention focused on two marginalized populations.

Methods

The analysis of secondary data was conducted on the Indiana University, Bloomington Campus. A CD-ROM data set which contained all deaths due to HIV/AIDS infections during 1997 was acquired from the Texas Department of Health. The 2,538 deaths due to HIV/AIDS infections were identified and selected for the study based upon year of

death. The data files were stripped of personal identifiers. Descriptive analysis of this data was performed. The predictor variables of this study were gender, race, age, education, and place of residence as sociocultural determinants. The outcome variable in this study was deaths due to HIV/AIDS as the underlying and supplemental causes of deaths.

During this period, the ICD-9 classification was used to indicate a diagnosis of HIV/AIDS diseases: codes 420, 421, 422, 429, 431, 432, 433, and 449 (AIDS, symptomatic HIV, asymptomatic HIV) (American Medical Association, 1999).

Confidentiality was preserved completely due to the removal of personal identifiers by the Texas Department of Health prior to acquisition by the researcher. There were no potential risks to the study population since there was no interaction with the research team. Data have been reported in aggregate terms. The Statistical Package for the Social Science (SPSS 10.0) was used to perform all descriptive statistical analysis in this study.

Results

In 1997, the cause-specific mortality rate due to HIV/AIDS infections in Texas was 1.31 per 10,000 inhabitants. HIV/AIDS related deaths (n= 2538) represented 1.73% of all causes of deaths in Texas, 1997.

Distribution by Age-Group

The study revealed that deaths due to HIV/AIDS infections were consistently higher in older age strata. The most substantial increase occurred among persons 35-64 years of age (46.10%), and greater than or equal to 65 years (36.50%), as shown in Table 1.

Table 1.
All HIV/AIDS Deaths: Distribution by Age, Texas, 1997

Age Group* (Years)	Frequency (Number of Cases)	Percent (%)
<4	4	0.15
5-14	9	0.35
15-34	429	16.90
35-64	1169	46.10
>65	926	36.50
Total	2537	100.00

*$\chi 2$ (28, n=2537)= .000, p<.05.

Distribution by Educational Level

A similar pattern was exhibited in the percent among persons with nine or more years of education with 84.24% of HIV/AIDS-mortality. The elementary and middle school level represented 15.76% of deaths due to HIV/AIDS infections. A significant association between deaths due to HIV/AIDS infections was demonstrated from this data, P2 (21, n=2538)= .000, p<.05. This was consistently higher among people with high school and college level education, as shown in Table 2.

Table 2.
All HIV/AIDS-Related Deaths: Distribution by Educational Level, Texas, 1997.

Education (Level)*	Frequency (Number of Cases)	Percent (%)
<5 (elementary)	158	6.22
6-8 (middle school)	242	9.54
9-12 (high school)	1232	48.54
>13 (college)	906	35.70

*$\chi 2$ (21, n=2538)= .000, p<.05.

Distribution by Race and Race-Sex

Whites were consistently higher in the frequency (52.40%) of deaths due to HIV/AIDS compared to African Americans (25.30%), and Hispanics (20.9%). HIV/AIDS related deaths varied substantially by race-sex strata. White-Males (31.72%) were followed by White-Females who accounted for approximately 20.72% of the HIV/AIDS-related deaths.

African American-Males (17.06%) with HIV/AIDS-related deaths were relatively higher than Hispanic-Males (15.05%). A significant association between deaths due to HIV/AIDS by race-sex strata was demonstrated by this data, P2 (3, n=2538)= .000, p<.05, with men being consistently higher than women in all race strata as shown in Table 3.

Table 3.
All HIV/AIDS-Related Deaths: Distribution by Race-Sex, Texas, 1997.

Race-Sex Group*	Frequency (Number of Cases)	Percent (%)
White-Males	805	31.72
White-Females	526	20.72
African A-Males	433	17.06
African A-Females	208	8.19
Hispanic-Males	382	15.05
Hispanic-Females	148	5.83
Other Males	26	1.02
Other Females	10	0.39

*$\chi 2$ (3, n=2538)= .000, p<.05.

In 1997, among African Americans there were a total of 641 deaths due to HIV/AIDS among a total of 18,103 deaths, yielding a cause-specific mortality rate by race of 354.1 per 10,000 deaths. A similar pattern was found in Hispanics with a total of 530 deaths due to HIV/AIDS among a total of 22,199 deaths the same year, giving a cause-specific mortality rate by race of 238.7 per 10,000 deaths. The cause-specific mortality rate by race-gender is shown in Table 4.

Table 4.
All HIV/AIDS- Cause-Specific Mortality Rate by Race-Gender, Texas, 1997.

Race-Gender Group	Frequency (Number of Cases)	Cause-Specific Mortality Rate*
White-Males	805	153.9
White-Females	526	100.2
African A.-Males	433	457.5
African A.-Females	208	240.8
Hispanic-Males	382	303.9
Hispanic-Females	148	153.7
Other-Males	26	390.9
Other-Females	10	186.6

*per 10,000 deaths.

Distribution by Place of Residence

The study revealed that deaths due to HIV/AIDS were higher in inner cities, represented by Houston (51.14%), Dallas (30.46%), San Antonio (18.23%), and Austin (0.17%). The rural areas represented by Hidalgo (0.9%), Cameron (0.5%), and Zavala (0.4%), showed that deaths due to HIV/AIDS were higher in urban compared to rural areas.

Discussion

The overall picture of HIV/AIDS-mortality obtained from this data revealed that adults were more commonly affected than children, and that men were more likely to die from this disease than women. Of particular interest is the fact that mortality from HIV/AIDS among Whites is higher than among minority groups. These results are contrary to the findings of other studies in the literature (Klevens, Diaz, Fleming, Mays, & Frey, 1999; Montoya, Treviño, & Kreitz, 1999; Estrada, 1998; Neal, Fleming, Green, & Ward, 1997; Murphy, Muller, & Whitman, 1996), and may indicate the possible underestimation of the impact of the epidemic on Hispanics, as well as other minority groups.

The well-established connection between social and health disparities and HIV/AIDS-related deaths in African Americans and Hispanics suggests underrepresentation of these two minorities in mortality statistics due to HIV/AIDS in Texas during 1997. This observation suggests the need to explore possible explanations regarding access and receptivity to HIV prevention and treatment efforts, socioeconomic status, sociocultural ancestry, sexual and addictive behavior, and factors that interact in a complex fashion to influence HIV transmission and progression to AIDS infections in these communities.

An important fact is that neither the federal government nor any local agency has yet published comprehensive AIDS mortality data to date. The literature does not appear to provide a validation of the methodology used to estimate the impact of this disease among communities of color. This appears to be necessary due to potential under/over estimates of HIV/AIDS data. The scarcity of or paucity of validation efforts in the literature may impact the availability and distribution of funds necessary for the prevention and treatment of HIV/AIDS in communities of color.

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Perceived Behavioral Control for HIV/STD Prevention among African-American Undergraduate Students

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Abstract

This study examined the perceived behavioral control/self-efficacy of undergraduate African-American students intention to use condoms. The other variables of the theory of planned behavior were also examined. The subjects were predominantly from Southern Historically Black Colleges and Universities (HBCUs). Two hundred and eighty seven females and 237 male students between the ages of 18 to 24 voluntarily participated in the study. Open ended questions were developed to elicit salient beliefs toward condom use to prevent the spread of HIV/STDs. Based on the responses to the open ended questions, a 62 item inventory was developed and administered to the subjects. The variables were examined using Pearson moment correlation, ANOVA, Boneferroni post hoc comparison, and level of significance was set at alpha = .05. Perceived behavioral control was the strongest predictor of behavior intention for both male and female students. African-American males scored low on attitude, subjective norm, and perceived behavioral control, while females scored higher on all three variables. The relatively higher score of females in the three variables provide a challenge to the health educator and public health professional in providing the necessary skills and resources that will empower women to reflect their perceived behavioral control in demanding that their partners consistently and effectively use condoms for sexual activities.

HIV prevention among youth is a critical national priority (DiClemente, 1990; National Institute of Health [NIH], 1997). According to Centers for Disease Control and Prevention (CDC, 1998a), sexually transmitted diseases (STDs) in the United States have reached epidemic proportions with an estimated 12 million new cases each year. One fourth of these occur among teenagers, between the ages of 13 and 19 years old. Unlike other diseases, STDs are the most common reportable diseases in the United States. (CDC, 1998b). Extensive research in biomedical and behavioral science has shown some correlation that people who are infected with other STDs are 2-5 times more likely to be infected with HIV. In addition, there is the geographic distribution of heterosexual HIV transmission in the United States that closely parallels that of other STDs. AMost of the health districts with highest STDs rates, such as syphilis and gonorrhea, in the United States are concentrated in the South, the same part of the nation with the highest HIV prevalence among childbearing women (CDC, 1998c, p. 1). African Americans and Hispanics are disproportionately affected (CDC, 1998b; CDC, 2000c). The brief biological explanation for the possible connection of HIV and the presence of other STDs is that some STDs cause genital lesions that can act as portal of entry for HIV. If there are no lesions, STDs by their chemistry increase the number of HIV target cells (CD4 cells) in the cervical secretion , thereby making it possible for HIV infection when a woman is exposed to the virus. (CDC, 1996; CDC, 1998c, CDC, 2000c).

According to the CDC, Athe impact of HIV and AIDS in the African-American communities has been devastating. Through December, 1998, CDC had received reports of 688,200 AIDS cases. Of these, 251,408 cases occurred among African-Americans. Representing only an estimated 12% of the total U.S. population, African-Americans make up almost 37% of all AIDS cases reported in this country. It is estimated that about 1 in 50 African-American men, and 1 in 160 African-American women are infected with HIV and that more than 106,000 African-Americans are living with AIDS (CDC, 2000b, p.1).

In 1998, more African-Americans were reported with AIDS than any other racial/ethnic group. African-Americans represent about 45% of all new AIDS cases, Aalmost two thirds (62%) of all women reported with AIDS were African-American. African-American children also represent almost two thirds (62%) of all reported pediatric AIDS cases (CDC, 2000b). The 1998 rate of reported AIDS cases among African-Americans was 66.4 per 100,000 population, more than 2 times greater than the rate for Hispanics and 8 times greater than the rate for Whites. Furthermore, among young people (ages 13 to 24), 63% of the HIV diagnosis were among African-Americans (CDC, 2000b, pp. 1-2). This represents an alarming situation for African-American communities who are presently losing their youth to homicide and the legal system. In addition, HIV related death has greatly impacted young and middle aged adults, particularly racial and ethnic minorities. Among African-American men and women aged (25 - 44), AIDS is the leading cause of death for men, and the second leading cause of death for women (Brooks, 1999; CDC, 2000b).

Racial and ethnic minority populations have been disproportionately affected by HIV infection and AIDS since the

beginning of the epidemic in the United States (CDC, 1993b). As of June 1996, 548,102 Americans were diagnosed as having AIDS (CDC, 1996), including 141,502 cases among African-Americans, 78,926 Hispanics, 3,888 among Asian/ Pacific Islanders, 1,202 Native Americans, and 236,490 Whites. Forty-eight percent of reported cases were among African-Americans and Hispanics, despite the two groups representing 21% of U.S. population (12% African-American and 9% Hispanic) (CDC, 1996).

HIV/AIDS in Rural America

HIV disease is an increasing problem in small towns and rural areas of America. The number of new cases being diagnosed in rural areas is growing at an alarming rate (National Advisory Committee on Rural Health [NACRH], 1990). According to the CDC (1995), the prevalence of HIV infection has increased rapidly in the southern part of the United States from 25.7% to 34.9% and in the mid-western region of the United States from 7.5% to 10.1%, for the periods 1981-1987 and 1993-1995 respectively. The number of HIV/AIDS cases has increased steadily from 4.9 to 8.0 per 100,000 in rural areas for the period from 1991 to 1997. Rural residents cannot ignore the threat of AIDS. A growing number of accounts indicate that this disease has penetrated rural America from Georgia to Washington, and it is disproportionately affecting ethnic minorities (Cleveland & Devenport, 1989; Wismer, 1992).

"AIDS has come home to Mississippi - often times to die. Once perceived to be a plague affecting other people - homosexuals, urban dwellers, intravenous drug users, prostitutes - AIDS is invading communities at every crossroad ..." (Hood-Adams, 1989, p.1A). Since this is happening, there is a lack of readiness of rural areas to deal with HIV infection and AIDS. In many rural communities, there is a denial that HIV disease is a problem that must be addressed. Factors which may contribute to this denial include disapproval of behaviors associated with HIV transmission, and health professionals unfamiliarity with the symptoms of HIV disease (NACRH, 1990; Kanu, 1997a).

In addition to lack of resources, rural environments provide unique problems for people with AIDS. The lack of anonymity and confidentiality in rural communities, and its association with homosexuality, prostitution, and drug use carries a certain degree of stigma and intolerance, which makes it emotionally challenging for people with AIDS in rural areas. This is exceptionally difficult for African Americans who have to face discrimination and prejudices on a regular basis for being Black, and if diagnosed with HIV/ AIDS will have to cope with further discrimination or alienation (Cleveland & Devenport, 1989; Johnson, 1993).

Risk Factors

The prevalence of sexual activity among African American adolescents has increased over the past two decades, and the age at which first sexual experiences are reported has also declined (CDC, 1991a; Keller et al., 1991; Porter, 1994). Early sexual experience can make adolescents more vulnerable to STDs and HIV infection. It is estimated that about 56 million people are infected with one or more incurable STD, other than HIV/AIDS (CDC, 1991b; Donovan, 1993; Yarber, 1993). A few examples of these diseases include genital herpes, human papilloma virus (HPV), and hepatitis B, which have severe consequences ranging from recurrent and painful outbreaks to chronic liver diseases and cancer. In addition to personal suffering, infected individuals knowingly or unknowingly transmit these viruses to their sexual partners, even when they have no current symptoms or have never had any symptoms (CDC, 1991b; Donovan, 1993; Yarber, 1993).

The number of young adult cases with multiple STDs, such as chlamydia, genital herpes, genital warts, and gonorrhea have dramatically increased in the past decade (Butcher, Manning, & O'Neal, 1991). The rapid spread of STDs among young people between the ages of 20 and 24 years has greatly contributed to the rapid rise in health care costs, morbidity, and mortality (CDC, 1991a; CDC, 1995; Kanu, 1997a; Kelly, 1996; Mahoney, Thombs, & Ford, 1995). According to the CDC (2000a), youth account for two thirds of the total number of cases of STDs diagnosed annually. Twenty five percent of sexually active adolescents contract an STD every year (Burstein et al., 1998; Kirby, 1999). Other STDs, such as syphilis, gonorrhea, and chlamydia are also prevalent among this population (CDC, 2000a). In addition, 99% of chlamydia cases are estimated to occur in persons under 25 years of age, and by the age of adolescence 4% of Caucasians and 17% of African-Americans have been infected by the herpes simplex virus (CDC, 2000a; Rotheram-Borus, O'Keefe, Kracker, & Foo, 2000).

Among African-American men with AIDS, men who have sex with men represent the largest proportion (38%) of reported cases since the epidemic began. The second most common exposure category for African-American men is injection drug use (35%) and heterosexual exposure accounts for 7% of cumulative cases (CDC, 2000b). Among African-American women, injection drug use has accounted for 44% of all AIDS cases reported since the epidemic began, with 37% due to heterosexual contact (CDC, 2000b). Studies have shown that 1.1% and 2.5% of male youths self-identify as gays or bisexual (Rotheram-Borus, et. al., 2000). Yet, this small group represents the majority of HIV infected youths. Homosexuals generally do not Acome out until adulthood; therefore, youth who are out are different from gay adults, and are at a much higher risk for HIV. These youth lack resources to seek and receive support for HIV prevention behaviors. Being gay in the general population is barely accepted, but within the African-American community it is even more frowned upon, and in some cases, individuals are ostracized (Brooks, 1999). Because of the social climate,

many African-American gay youths are forced to seek romantic partners and services outside of their local communities. This puts them at a greater risk of meeting seropositive sexual partners and older partners (Rotheram-Borus, et. al., 2000).

Most heterosexual HIV positive youth acquire HIV primarily because of the environment in which they live: increased possibility for drug-use and drug dealing. Within this context the probability of heterosexual transmission has been associated with more frequent intercourse (Norris & Ford, 1998), multiple sex partners within relatively short time period, intercourse with older partner(s) (Dorroch, Landry, & Oslak, 1999), and co-occurring of sexually transmitted disease (CDC, 1998b). As the age of sexual debut is getting younger nationally (Kann et al., 1998), prevention of high-risk sexual behaviors is needed at younger ages. Currently, the age of initiation of sexual intercourse for most youth is between 16 and 19 years of age. This age for minorities (African-American and Hispanic) is much younger (Kanu, 1997). Once initiating sexual intercourse, youth engage in sexual activities intermittently (CDC, 1997).

Ethnic and gender differences exist in sexual behaviors and AIDS case rates, demonstrating the importance of intervening early among inner-city and rural low-income African-American and Hispanic youth (CDC, 2000a). Overall, African-American males are at greater risk, associated with the number of sexual partners and that they initiate sex at younger ages than peers of other ethnic groups (Kann et al.; 1998, Kanu, 1997). In addition, one third of African-American adolescents (9 to 15 years old) reported having had experience with vaginal and anal intercourse (Stanton, Li, Black, Ricardo, & Galbraith, 1994). An apparent paradox emerges in African-American males. They are more likely to report 100% condom use, and at the same time report higher rates of unprotected sex (Sonenstein, Ku, Lindberg, Turner, & Pleck, 1998).

African-American College Students and HIV/STDs

The AIDS epidemic is cause for concern, especially when studies indicate that some three quarter of the American college student population frequently engage in risky behavior for contracting HIV/STDs (CDC, 1991a; Johnson, Gilbert, & Lollis, 1994). Recognition of the potential for high rates of HIV infection among college students in the United States has prompted a considerable amount of research investigating various avenues for AIDS reduction in this population (Johnson et. al., 1994). The years spent at college are for many a period of sexual exploration: an interval of risk to students who are misinformed or who failed to take precautions to prevent exposure to HIV, thinking that they are invincible (Cerwonka, Isbell, & Hansen; Kanu, 1997b).

Many students practice pregnancy and STD risk behavior everyday for reasons such as wanting to be accepted by their peers, or just wanting a baby as something to love (Barth, Fetro, Leland, & Volkan, 1992). A most startling observation is that the percentage of African-American males, in a sample of college students in the South, who tested positive for HIV/AIDS was 6.5%, which was disproportionately higher than other ethnic groups (CDC, 1993b).

It was found that 13% of African-American undergraduate students consider themselves to be at risk for HIV/AIDS, and 19% of African-American females and 47% of African-American males were sexually involved with more than one partner (CDC, 1988b; Johnson et. al., 1992). In addition, 21% of females used condoms with their sexual partner while 34% of the males always used condoms with their sexual partners (Johnson et al., 1992). The use of drugs within this population, with the exception of alcohol, is relatively low. These estimates, coupled with a study conducted by the CDC, revealed that college students are at significant risk for HIV infection (Civic, 1999; Kanu, 1997b).

There is some evidence that college students in general possess adequate knowledge about HIV. However, African-American adolescents appear relatively less knowledgeable about the cause, transmission, and prevention of HIV infection than their white counterparts (DiClemente & Houston-Hamilton, 1989; DiClemente & Wingwood, 1995). Compounding this lack of crucial information, African-American adolescents tend to perceive themselves less at risk for HIV infection and are not as likely to incorporate self protective behaviors, such as condom use during sexual intercourse. In addition, African-American adolescents and young adults have myths and misconceptions about HIV acquisition related to casual contagion (DiClemente & Houston-Hamilton, 1989; Hammonds, 1987). Furthermore, among adolescents reported with AIDS, older teens, males, and racial and ethnic minorities are disproportionately affected (Donovan, 1993). According to Gayle, Battle, Barker, and Krasnovskey (1999), both worried and non-worried African-American women regarding HIV infection reported equal risk behaviors for HIV infections, such as inconsistent or no condom use, and engaging in sexual activities with risky sexual partners. Similarly, among women with AIDS, African-American women and Hispanic women are disproportionately represented, but especially African-American women of lower socioeconomic status.

There is a noticeable lack of research that specifically focuses on lifestyles and sexual behaviors that promote transmission of HIV among young African-American adults (Johnson, 1993). Studies have shown that there is very little information available regarding factors that might be responsible for observed race/ethnic differences in AIDS knowledge or about factors that facilitate the spread of AIDS among African-Americans (Johnson, 1993; Johnson, Gant, Hinkle, Gilbert, 1992).

African-American College Students and Condom Use

The most effective way to prevent sexual transmission of

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HIV infection and other STDs is to avoid sexual intercourse with an infected partner. If a person chooses to have sexual intercourse with a partner whose infection status is unknown or who is infected with HIV or other STDs, men should use a new latex condom with each act of intercourse. When a male condom cannot be used, couples should consider using a female condom (CDC, 1988a).

According to the CDC (1993b), Shaw and Rienzo (1995), and Wendt and Soloman (1995) the proper and consistent use of latex condoms when engaging in sexual intercourse (vaginal, anal, or oral), can greatly reduce a person's risk of acquiring or transmitting STDs, including HIV infection. For a condom to provide total protection it must be used consistently and correctly (CDC, 1993a). Consistent use means using a condom from start to finish with each act of intercourse. Correct condom use should include the following steps: (a) use a new condom for each act of intercourse, (b) put on the condom as soon as an erection occurs and before any sexual contact - vaginal, anal, or oral, (c) hold the tip of the condom and unroll it onto the erect penis, leaving space at the tip of the condom, yet ensuring that no air is trapped in the condom's tip, and (d) withdraw from the partner immediately after ejaculation, holding the condom firmly to keep it from slipping off (CDC, 1993a; Shaw & Rienzo, 1995). Several studies have shown that condoms when used correctly and consistently can reduce the risk of HIV transmission. However condoms do not provide total prevention (CDC, 1988a). In order to increase their effectiveness, condoms must be used in a manner that prevents the individual from contacting semen, pre-ejaculation fluids, vaginal and cervical secretions, genital, oral, or anal lesions (CDC, 1988a).

Several studies have indicated that condoms are not consistently used among individuals within the African-American community who are at risk for HIV/STDs (Johnson, 1993). What is more puzzling is that there has been very little research focusing on the variability of condom use within the African-American community. Most investigations of attitude about the use of condoms have been to compare African-Americans and other ethnic groups with their white counterparts (Johnson, 1993).

According to Johnson (1993), African-Americans who used condoms consistently had strong social support, and they also had positive expectations about condom use. These individuals were less likely to be HIV positive than people who did not frequently use condoms and/or who have negative expectations about condom use. In addition, even though African-American college students rely on social support from their parents or authorities in influencing their behavior, they rely strongly on the support from their peers. (Jemmott & Jemmott, 1991). Peer relations and perceptions of peers also appear to have significant impact on youth's protective behaviors and should be a target of prevention programs (Rotheram-Borus et. al., 2000). Condom use is more likely if youth believe their peers use them (Kanu, 1997a; St. Lawrence et al., 1998). Adolescent females use is also affected by their perceptions. For many female youths, male partners are often older and may refuse to use condoms (Advocate for Youths, 1996). Youths with much older partners use contraceptives less frequently and are four times more likely to be pregnant and fear of abuse of insisting on condom use (NIH, 1997). Adolescent females who use psychoactive substances during sex report a higher number of sexual partners and a greater likelihood of having had an STD. While the number of youth infected directly from substance abuse is low, substance abuse impairs decision making and is indirectly linked with the risk of HIV transmission more often for youth than for adults (Siegal, Goodman, & Emans, 1999).

Unfortunately, due to misconceptions and stereotypes that prevail within the African-American community, most African-Americans do not use condoms with their sexual partners. It is even worse for African-American women who in some cases have to share men because of the shortage of "available" or eligible African-American men in their community (Jemmott & Jemmott, 1991; Johnson, 1993; Thomas, Gilliam, & Iwrey, 1989). It is therefore obvious, if the rapid spread of HIV/STDs is going to be reduced or controlled, that African-American males have a greater role to play in stressing the use of condoms or practice other preventive means with their sexual partner whenever they have anal, oral, or vaginal intercourse. Many African-American males who do not use condoms are not concerned about non condom use, and they are very much at ease with partners who would rather have unprotected sexual intercourse. Furthermore, in one study 17% of the respondents reported that contraception is the responsibility of the male, while 70% of the subjects believe that contraception is the responsibility of the female (Jemmott & Jemmott, 1991).

In addition, one of the strongest determinant of condom use or non use is embarrassment (Catania, Coates, & Kegeles, 1994). Condom embarrassment is the psychological discomfort, self consciousness, and feeling of being ill at ease associated with condom use (Vail-Smith, Durham, & Howard, 1992). Similarly, African-American college students who perceive that condoms may have the potential to reduce sexual enjoyment are less likely to use condoms (Catania, Coates, Stall et al., 1992; Catania, Coates, & Kegeles, 1994; Catania, Coates, Golden, et al., 1994) Other reasons for non-use include decreased sensation, unacceptability to partner, and unavailability (Johnson, 1993). These results may help explain the necessity to explore the inconsistency and low degree of condom compliance among African-American young adults (Johnson, et al., 1994).

Studies indicate that even though African-American college students may have acquired the needed information about the effectiveness of condom use in reducing or preventing the spread of HIV/STDs, if they are embarrassed to purchase or acquire condoms, they are less likely not to use condoms. In addition, if African-American college students

consider using a condom to be morally repugnant they are more likely to use the condom (Catania, Coates, & Kegeles, 1994; Kanu, 1997a; Vail-Smith et al., 1992).

Similarly, perceived environmental or financial barriers to acquisition of condoms can also prevent or encourage condom use. African-American college student's condom use is related to perceived sexual enjoyment. If sexual enjoy ment was perceived in the past while using a condom, the individual was more likely to use condoms in the future (Catania, Coates, & Kegeles, 1994; Catania, Coates, Golden et al., 1994; Johnson, 1993; Kelly, 1996). It is not surprising that condom association with sexual enjoyment is an important predictor of condom use, because sexual pleasure is a major reason that people in the first place engage in sexual activities (Catania, Coates, & Kegeles, 1994; Vail-Smith et al., 1992).

Studies indicated that communication skills that enable people to negotiate condom use is a key component to encourage partner(s) to use condoms. Unfortunately, because of the unequal proportion between women and eligible men among the African-American community (Cochran, 1990), African-American women have a tougher time, or almost impossible time, of negotiating with their potential male sex partners who may not be willing to use condoms (Catania, Coates, Golden et al., 1994; Johnson, 1993; Thomas et al., 1989).

According to Wulfert and Wan (1993), condom use in heterosexual relations depends to a significant degree on three factors, (a) the expected consequences of condom use, (b) perceived social support for condom use, and (c) perceived behavioral control or self-efficacy. Statistics released by the CDC (1994), have shown a gradual increase in HIV infection contracted through heterosexual intercourse. In 1983, only 1% of all diagnosed AIDS cases was attributed to heterosexual contact, in 1990 the number has risen to about 5% and in 1994 the number has risen to 7% and rising. The rapid increase was mainly due to the increase of HIV infected people among African-American females and African-American males in particular (CDC, 1994). Even with the increase in the number of HIV infected cases on the rise among this population, they still do not consider not using condoms as a risky behavior for contracting HIV/STDs (Wulfert & Wan, 1993). Similarly, less than one fifth of heterosexuals with a risk factor reported using condoms consistently (Catania et al., 1992). A focus on the African-American culture will be extremely helpful in effectively knowing the barriers for condom use and what needs to be done to promote consistent use among this population (Airhihenbuwa, DiClemente, Wingood, & Louce, 1992).

Knowledge about HIV/STDs has not been found to be strongly related to behavior change and the adoption of prevention and risk reduction behavior (Cerwonka et. al., 2000; Mahoney et al., 1995). It is possible, therefore, that many students fail to use knowledge as a basis for guiding their own sexual behavior (Caron, Davis, Wynn, & Roberts, 1992). Hence, there is urgent need to examine other variables, such as attitude, subjective norms, perceived behavioral control, and behavioral intention toward engaging in preventive and risk reduction behaviors by properly and consistently using condoms during vaginal or anal intercourse (Ajzen & Madden, 1986). This study will focus on the utilization of the components of the theory of planned behavior, developed by Ajzen (1988), to predict the behavioral intention of African-American college students to use condoms with their sex partner.

Successful utilization of the theory of planned behavior may be useful in the prediction of factors that influence risky behaviors involving sexually transmitted diseases (STDs). Furthermore, it will help health educators design appropriate educational programs to prevent the spread of HIV/STDs among this vulnerable population (Mays, & Cochran, 1990; St. Lawrence et al., 1995).

The Theory of Planned Behavior

It is apparent that with the disproportionate impact of AIDS in Black and Hispanic populations, special emphasis must be placed on reaching minority populations with effective HIV risk reduction and AIDS prevention programs, based on theoretical and scientific background (Johnson, 1993). In order to plan effectively and evaluate these programs, it is crucial to have an understanding of their attitude, subjective norms, and perceived behavioral control towards HIV risk reduction activities, like using condoms effectively and consistently whenever they engage in sex with their partners. In addition, it is also vital to have an understanding of the AIDS knowledge deficiencies, myths, and behavioral risk factors that may act as barriers to effective educational intervention focused on preventing the spread of HIV in minority population (Thomas et al., 1989; DiClemente, 1992).

This study utilized the theory of planned behavior (Ajzen, 1985; Ajzen, 1988; Ajzen & Madden, 1986; Madden, Ellen, & Ajzen, 1992) as a framework for understanding the determinants of intention to use condom among African-American undergraduate students.

The theory of planned behavior (TPB) is an extended form of the theory of reasoned action. The concept of perceived behavioral control was added in order to increase the theory's predictive value for behaviors that are not purely under one's control (Ajzen, 1985; Madden, et al., 1992). For example, intention to use condoms depends upon the cooperation of other people, or is based upon possession of adequate resources or opportunities. Because of the involvement of these and other factors, condom use is not completely under an individual's volitional control (Ajzen, 1985; Ajzen & Madden, 1986).

According to Ajzen (1985), the theory of planned behavior has three main conceptual independent variables of intention. The first is the attitude toward the behavior and refers to the degree to which the person has favorable or

unfavorable evaluation of the behavior in question. The second concept is a social factor termed subjective norm. It refers to the perceived social pressure to perform or not to perform the behavior (Ajzen, 1988). The third determinant is the degree of perceived behavioral control. This concept refers to the individual's perceived ease or difficulty in performing the behavior in question. It is assumed that the ease or difficulty in performing a behavior is influenced by one's past experience, as well as anticipated obstacles (Ajzen, 1988). As a general rule, Athe more favorable the attitude and subjective norm with respect to behavior, and the greater perceived behavioral control, the stronger should be the individual's intention to perform the behavior under consideration (Ajzen, 1988, pp. 132-133).

As in the case of most theories, the theory of planned behavior is based upon series of assumptions in order to explain its validity and its effectiveness in predicting the intended behavior. These assumptions are as follows. First, human beings are rational people who make systematic use of information available to them in making decisions. Second, an individual's intention to perform or not to perform a behavior is influenced by one's attitude toward that behavior with a keen sense of understanding the possible outcome of performing or not performing the behavior. Third, an individual's behavior is influenced by social factors such as getting support from parents/family members, authorities, friends, and peers to perform or not to perform a behavior in question. In addition, performing or not performing a behavior is influenced by the individual's motivation to comply. This means that an individual's decision is not always purely under his/her control or volition. Lastly, an individual's perceived behavioral control means the ease or difficulty an individual faces in performing the intended behavior (Ajzen, 1988).

With reference to young African-American undergraduate college students, the transmission of HIV/STDs from one person to another involves understanding the psycho social dynamics within the young African-Americans' society. Understanding the various psycho social factors and the role they play in decision making within this group is a vital component in predicting behavioral intention.

Ajzen and Fishbein (1980) believe that human behavior is controlled by conscious motives, and that people study the implications or consequences of their actions before they decide to either perform or not to perform a behavior. It is assumed that this reasoning also applies to African-American young adults whenever they are faced with a decision to use or not to use condoms to prevent the spread of HIV/STDs.

Research and theoretical considerations suggest that self-efficacy or perceived behavioral control play an important role in determining whether a person practices protective sexual behaviors or not. These practices includes: discussing condom use with partner, using condoms during intercourse, or refusing to have intercourse if condoms are not to be used. According to Bandura (1994), and Cecil and Pinkerton (1998), self-efficacy refers to a person's belief concerning how capable he or she is of performing specific actions that result in specific outcomes. In particular, self-efficacy focuses on individual convictions that they can exercise control over their motivations, behaviors, and social environments. Individual's beliefs about their capabilities will greatly influence the behavior they engage in, how much effort they expend, how long they persist when faced with obstacles, and whether they engage in self-debilitating or self encouraging cognition toward the behavior in question.(Ajzen, 1988; Cecil & Pinkerton,1998; Kanu, 1997a).

Method

The following research questions for this study were developed using the guideline of the theory of planned behavior. Is there any relationship between attitude and subjective norm of African-American undergraduate students and their intention to use condoms? Is there any relationship between perceived behavioral control or self-efficacy of African-American undergraduate students and their intention to use condoms? Is there any relationship between age and religiosity of African-American undergraduate students and their intention to use condoms? The relationship among the theory variables were analyzed using the SPSS version 6.0 statistical package. The following statistical procedures were used to analyze the data: Pearson correlation, multiple regression, and analysis of variance (ANOVA). Modified Bonferroni comparison was done if f value was significant to indicate where significant differences exist. All analysis was done at alpha level of significance of 0.05.

Subjects

Five hundred and twenty four students, 237 males and 287 females (18 - 24 years of age) who participated in the study were from predominately historically Black colleges and universities (HBCUs) in the non-metropolitan regions in the South. This population was selected based upon the growing incidence of HIV/STDs cases among the African-American population of this age group and in rural parts of the country.

Intent to Condom Use Inventory

A sixty-two item inventory that was administered to the subjects was developed from salient beliefs obtained from 10 open ended questions. This inventory addressed the following variables: attitude toward performing a behavior, subjective norm, perceived behavioral control (self-efficacy), and behavioral intention toward performing a behavior.

The variables attitude, subjective norm, perceived behavioral control, and behavioral intention were assessed on a 5

point scale based upon the intention to perform risky behaviors for HIV/STD during the next month. The variable attitude to performing or not performing a risky behavior for HIV/STDs during the next month was rated using a 5 point bipolar pair. Subjective norm, the likelihood that significant others would want the subject to perform or not to perform risky behavior for HIV/STDs during the next month was scored on a scale consisting of strongly agree, agree, not sure, disagree, to strongly disagree. Perceived behavioral control, confidence in one=s ability to perform or not perform a risky behavior for HIV/STDs, was rated on a scale from 1 to 5. Behavioral intention was scored on a scale of strongly agree, agree, not sure, disagree, to strongly disagree. The Cronbach alpha reliability coefficient for the instrument was .90 alpha.

Results

Null Hypothesis: There is no relationship between attitude of African American undergraduate students and their intention to use condoms.

A Pearson's correlation between attitude for the entire sample and behavioral intention indicated correlation coefficient of $r = .49$ ($p < .01$) The null hypothesis was rejected. Further analysis was performed using descriptive statistics for test of significance between gender and the component attitude toward behavior. There was significant difference between female and male students ($F = 7.35$, $p < 0.01$). Pearson correlation coefficient for African-American female attitude toward behavior was $r = .53$ ($p < .01$), and for African American males college students $r = .44$ ($p < .01$). (Tables 2 and 3.)

Null Hypothesis: There is no relationship between subjective norm and intention to use condoms.

Pearson's correlation between subjective norms for entire sample and behavioral intention showed a correlation of $r = .62$ ($p < .01$). See Table 1. The null hypothesis was rejected. There was a significant difference between female and male students ($F = 5.69$, $p < .05$), and for females $r = .63$ ($p < .01$) and males $r = .61$ ($p < .01$). (Tables 2 and 3) Intention to use condoms were significantly effected by subjective norm.

Null Hypothesis: There is no relationship between perceived behavioral control and the intention to use condoms.

A Pearson's correlation between perceived behavioral control for the entire sample and behavioral intention showed a correlation coefficient of $r = .73$ ($p < .01$). (See Table 1.) The null hypothesis was rejected. Further analysis were performed to find where gender differences exist. There was no significant difference between female and male students ($F = 0.77$, $p = 0.38$); African-American female ($x = 53.28$) and male ($x = 53.60$). African-American female and male college students were slightly similar in their perceived behavioral control. Correlation coefficients were calculated for females ($r = .75$, $p < .01$) and males ($r = .71$, $p < .01$). (See Tables 2 and 3.)

There are distinct differences between women and men when dealing with sexuality. Exploring gender differences, mainly perceived behavioral control, will help in understanding condom use behavior.

See Table 4 for a summary of descriptive statistics and test of significance between gender and the component of perceived behavioral control. Data indicates no significant difference between male and female students ($F = 0.77$, $p = 0.38$). African-American male ($x = 53.60$) and female ($x = 53.28$) students were slightly similar in their perceived behavioral control toward use. Correlation coefficients were calculated for males ($r = .71$, $p < .01$) and females ($r = .75$, $p < .01$). There was a significant relationship between perceived behavioral control and intention to use condoms for male and female African-American undergraduate students. A multiple regression analysis was used to determine if significant relationship existed. Perceived behavioral control explains more of the variance of the dependent variable, behavior intention. Attitude, subjective norm, and perceived behavioral control explain 57.3% of the total variance of behavioral intention, while attitude, subjective norm, and perceived behavioral control explain 60.4% of the variance for females. The three components of the theory contribute to an explanation of 54% of the variables for males.

The study indicated that there was significant difference between behavioral intention and age for both genders. Significant difference was also found between behavioral intention and religiosity.

Discussion of the Findings

The three variables have a positive and significant impact in predicting intention to use condoms, by both African-American male and female college students. African-American female students reported slightly more positive attitudes, subjective norms, and perceived behavioral control toward condom use than African-American males. Gender differences existed in the prediction of behavioral intention and condom use. Females have a positive attitude for intention to use condoms, but not for males. Both genders have favorable subjective norm toward intention to use condoms. Perceived behavioral control appeared to be an important factor in predicting behavioral intention for both male and female. The finding that attitude predicted intention to use condoms for African-American female college students may be related to the perception of outcome of using condoms. As noted earlier, consequences of not using condoms may be serious for women and men. Women are more likely than men to experience some of the more serious negative consequences, including unintended pregnancy and HIV/STDs infections.

Consistent with the findings of DeBlassie (1993), Jemmott and Jemmott (1991), and Jemmott and others (1995), Young African-American students are more likely to engage in risky sexual behaviors that expose them to HIV/STDs. Religios-

Table 1:
Pearson Correlations among Subscales on the Instrument (n = 524)

	BI	ATB	INDIRATB	SN	INDIRSN	PBC
BI		.49*	.36*	.62*	.21*	.73*
ATB			.23*	.56*	-.06	.54*
INDIRATB				.37*	.04	.31*
SN					.37*	.69*
INDIRSN						.17*
PBC						

*p < .01.

Table 2:
Pearson Correlations among Subscales on the Questionnaire for Females (n = 287)

	BI	ATB	INDIRATB	SN	INDIRSN	PBC
BI		.53*	.39*	.63*	.20*	.75*
ATB			.21*	.57*	-.07	.59*
INDIRATB				.40*	.01	.33*
SN					.20*	.69*
INDIRSN						.10*
PBC						

*p < .01

Table 3:
Pearson Correlations among Subscales on the Questionnaire for Males (n = 237)

BI	ATB	INDIRATB	SN	INDIRSN	PBC
BI	.44*	.33*	.61*	.22*	.71*
ATB		.23*	.53*	-.06	.49*
INDIRATB			.32*	.08	.30*
SN				.29*	.69*
INDIRSN					.25*
PBC					

*p < .01

Table 4:
Gender Differences in Perceived Behavioral Control Toward Intention to Use Condoms

Perceived Behavioral Control	Male (n = 237)	Female (n = 287)	F Value Probability	Post Hoc
Mean	53.60	53.28	F = 0.766	Not
Standard Deviation	7.63	7.00	P = 0.382	Significant

* p < .05
** p < .01

41

ity is also a factor in college students relative to abstaining from sexual activities or intend to use condoms to prevent the spread of HIV/STD.

Conclusion

Based on the findings and within the limitations of this study, the following conclusions were made: For both African-American male and female college students, attitude toward a behavior, subjective norm, and perceived behavioral control were predictors of behavioral intention.
Perceived behavioral control was the strongest predictor for intention to use condoms.

African-American females have a more positive attitude to use condoms, and a more favorable subjective norm, and a higher perceived behavioral control than males for intention to use condoms.

Implementation

According to the findings of this study, the following suggestions for implementation are warranted: 1) Intervention programs should be comprehensive and be sensitive to the differences between the genders. Gender specific intervention programs should be developed and encourage more communication between the genders as to how best they can prevent themselves from getting HIV/STDs; 2) HIV/STD prevention program should incorporate the support of partners, family, community, policy makers, and religious leaders. There is need for social support. On college campuses utilize the Greek Fraternity system, have seminars and workshops presented by peers, faculty, and experts from the community, provide information through college newspapers, radio stations, billboards, and other school activities that reach the college student; 3) Even though African-American female students have, in general, a favorable intention to use condoms, they should become empowered with skills, such as assertiveness and positive self-concept, to insist their partners always use condoms or there will be no sex. In high schools and colleges/universities utilize role playing in the classroom to discuss HIV/STD prevention and condom use. All of these should be done in their cultural context; 4) African-American males should be encouraged to be more responsible for the reduction and prevention of AIDS/STDs. They should be taught to respect their female partner who insists on condom use, rather than calling her names or forcing her to engage in unsafe sexual activities.

Recommendations

Recommendations for further research in regards to the intention to use condoms by African-American young adults to prevent the spread of HIV/STDs are as follows: 1) This study should be replicated with a sample of undergraduate college students from Historically Black Colleges and Universities in other regions of the United States, both metropolitan and non-metropolitan; 2) Future research in the area of HIV prevention should be based on scientific and theoretical background. Subject areas could include abstinence, fidelity, mutual monogamy, HIV testing, and healthy relationships; 3) Further research is needed to explain gender differences using the variables of the theory of planned behavior, and the role of the social elements for young African-Americans in the United States; 4) Health educators should be aware of the complex nature of sexuality within the African-American community. Program planning and development needs to be a community based effort, with special emphasis on getting input from the target population; 5) Gender specific programs should be developed to help educate and empower individuals with the skills, knowl edge, and self-esteem enhancement needed to deal with re spective partner(s); 6) Educational materials should utilize music, videos, celebrities, and spirituality related to the cul ture; 7) Sexually active African-American college students should be encouraged to take an HIV test, especially if they have engaged in risky behaviors for HIV/STDs; 8) Support for prevention strategies should be strengthened, given the limitation of new combinations of drug treatment. This is critical, because in a few individuals the drug cocktail has reduced the viral lode to be undetectable in the blood (cured not cured), and may create a false sense of security in the most vulnerable populations (African-American and Hispanic communities); 9) Target audiences should be clearly identified for intervention programs, so that their specific needs can be addressed appropriately; 10) Partnership with the community and with the media should be cultivated to encourage leaders and policy makers in media organizations to advance comprehensive HIV/STDs prevention messages.

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Psychosocial distress among gay and bisexual men living with HIV/AIDS in small U.S. towns and rural areas

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Abstract

A growing amount of research has examined the life quality of people living with HIV/AIDS in small towns and rural communities. However, most of this research has combined heterosexual and gay participants into one large sample, thereby ignoring psychosocial issues specific to HIV-infected gay and bisexual men in rural communities. The current study examined levels of psychological distress and perceptions of loneliness among 125 HIV-infected gay and bisexual men living in rural communities of eight states. Results showed that HIV-infected gay and bisexual men in rural areas demonstrated significantly higher levels of depression, anxiety, and stress compared to a reference group of non-clinical volunteers. Additionally, many participants reported increased perceptions of loneliness, with bisexual men reporting more loneliness than their gay-identified counterparts. Finally, participants with higher levels of depression were significantly more likely to be White, report increased perceptions of loneliness, and live in communities with smaller populations. Innovative mental health support services are increasingly needed for the growing population of HIV-infected gay and bisexual men who live outside of America's largest cities.

Through June 1999, there were approximately 41,000 persons living with AIDS in small towns and rural areas of the United States, and this does not include the much larger number of individuals who are living with HIV infection but have not yet progressed to AIDS (Centers for Disease Control and Prevention, 1999). Between 1991 and 1992, the number of AIDS cases in nonmetropolitan areas increased 9.4% which was three times greater than the 3.1% increase that was observed in large metropolitan areas during this same time period (Graham, Forrester, Wysong, Rosenthal, & Perry, 1995). Much of the increase in rural AIDS appears related to unsafe sexual behavior among gay and bisexual men. Between 1990 and 1995, the rate of AIDS cases in rural areas among men who have sex with men (MSM) increased by 69%, compared to a 19% increase among gay and bisexual men in America's largest cities (Sullivan, Chu, Fleming, & Ward, 1997). Clearly, AIDS is no longer a problem confined to America's largest cities, and gay and bisexual men in rural areas are especially vulnerable to HIV infection.

People living with HIV disease in rural communities confront many barriers and predicaments that complicate their adjustment efforts and reduce their overall life quality. HIV-infected rural residents are challenged by a lack of adequately trained medical and mental health care practitioners, vast geographic distances that separate them from sources of social support, insufficient or unreliable sources of transportation, concerns about breaches of confidentiality, and a lack of adequate and affordable housing (Berry, McKinney, & McClain, 1996; Bozovich et al., 1992; D'Augelli, 1989; Heckman, Somlai, Otto-Salaj, & Davantes, 1998; Rounds, 1988; Smith, Landau, & Bahr, 1990; Wismer, 1992). Many of these barriers, such as inaccessible social support resources (e.g., support groups) are likely to result in maladaptive ways of coping and exacerbate already high levels of psychosocial distress (Bozovich et al., 1992).

In perhaps the only study to directly compare urban and rural people living with HIV/AIDS, Heckman and colleagues (1998) compared 90 urban and 42 rural persons living with HIV/AIDS on a battery of psychosocial and life-care measures. Even after controlling for differences associated with race and gender, rural respondents reported significantly lower life satisfaction, coped less adaptively with life stressors, and received significantly less social support from family members and friends. Rural respondents were also significantly more fearful that their HIV serostatus would be discovered by others and were more likely to report that residents of their community stigmatized people living with HIV disease.

Gay and bisexual men living with HIV/AIDS are especially likely to experience elevated levels of psychological distress. Chuang, Devins, Hunsley, and Gill (1989) reported that the vast majority of participants in their sample of 65 HIV-infected gay and bisexual men evidenced clinically significant levels of depression, mood disturbance, anxiety, and hopelessness. Because of the demoralizing predicaments that gay and bisexual men living with HIV disease in rural communities encounter, this group may be at even higher risk for mood and adjustment disorders. HIV-infected MSM in rural communities lack a cohesive support community and must travel considerable distances to access empathic communities. HIV-infected MSM in rural areas are also likely to encounter frequent incidents of discrimination, stigma, or prejudice associated with their sexual orien-

tation and HIV serostatus. This latter possibility is unsettling, since HIV-infected persons who experience more frequent incidents of AIDS-related discrimination report a significantly lower quality of life (Heckman, Somlai, Sikkema, Kelly, & Franzoi, 1997).

In response to the lack of research characterizing the mental health needs of HIV-infected MSM in rural areas, the current study examined levels of depression, anxiety, and stress among a sample of 125 HIV-infected self-identified gay and bisexual men living in rural areas of eight states. All participants were enrolled in a randomized clinical trial evaluating the ability of a telephone-delivered coping improvement intervention to enhance the adjustment efforts and life quality of HIV-infected rural residents. Using data collected during study eligibility screening interviews, the current study sought to: (1) characterize levels of psychological distress and loneliness among HIV-infected MSM living in small towns and rural communities; and (2) identify correlates of depression among this group. Study findings can inform the development of innovative mental health support services for HIV-infected gay and bisexual men in rural communities.

Method

Participants and Procedures

Data summarized in the current study were collected during eligibility screening interviews conducted during the initial phase of a randomized clinical trial involving HIV-infected persons living in small towns and rural communities of the United States. The four-year study is examining the impact of a telephone-delivered coping improvement intervention (Heckman et al., 1999) on the adjustment efforts of HIV-infected rural residents. Between July 1999 and January 2000, screening interviews were conducted with 242 individuals, of whom 212 satisfied the following inclusion criteria: (1) provision of informed consent; (2) 18 years of age or older; and (3) residence in a community of 50,000 or fewer that was located at least 20 miles from a city of 100,000 or more. There were no inclusion criteria related to the presence of psychological distress. The 30 individuals denied entry into the program were excluded because they resided in communities of 50,000 residents or more. The 212 eligible participants enrolled into the study to date were recruited from the following states: Ohio (47%), Virginia (14%), Pennsylvania (12%), Wisconsin (11%), Michigan (7%), West Virginia (4%), Alaska (3%), and Montana (2%).

All study participants were affiliated with, and recruited through, AIDS service organizations (ASOs) in each of the eight states. All ASOs participating in the study provided a variety of life care services to people living with HIV disease (e.g., financial assistance, legal counseling, pastoral counseling). To recruit study participants, the study institution sent an agreed upon number of recruitment-related brochures to each ASO, who in turn disseminated these materials to their HIV-infected clients living in small towns and rural communities. Recruitment-related brochures described the telephone-based intervention as "a program for people living with HIV disease in small communities," outlined study inclusion criteria, and provided instructions needed to contact the study institution for enrollment into the project. Recruitment materials also indicated that individuals assigned to one of the two study intervention conditions would have the opportunity to "share your experiences with others, talk with other people living with HIV disease in small towns and rural areas, all while remaining in the privacy of your own home." When potential participants contacted the study institution, a research staff person briefly described the program, answered questions posed by the participant, and administered the study's eligibility screening instrument. The eligibility screening process took approximately 15 minutes to complete and included the following measures:

Depression Anxiety Stress Scale (DASS-21) (Antony, Bieling, Cox, Enns, & Swinson, 1998). The 21-item DASS was used to assess current levels of depression, anxiety, and stress. The DASS-21 is especially well-suited for the assessment of these conditions since it minimizes the amount of overlap among them. Seven items commonly associated with dysphoric mood (sample items: "I felt that life was meaningless" and "I felt down-hearted and blue") assessed depression and demonstrated very good internal consistency (a=.86). Seven items associated with physical arousal and fear (sample items: "I felt I was close to panic" and "I felt scared without any good reason") assessed anxiety and demonstrated adequate internal consistency (a=.75). Finally, seven items commonly associated with tension and irritability (sample items: "I found it difficult to relax" and "I felt that I was using a lot of nervous energy") measured stress and demonstrated good internal consistency (a=.80). All subscale items were summed and averaged, placing each participant's subscale score on the original scale (0="Not at all" to 3="Extremely"). Higher values indicate more of the construct being assessed. Please see Table 1 for sample items.

Revised UCLA Loneliness Scale (RULS) (Russell, Peplau, & Cutrona, 1980). Three items were randomly selected from the RULS and used to assess perceptions of loneliness. Each item (sample item: "I feel isolated from others") asked respondents to use a four-point Likert scale to assess level of agreement with each item (1="I have never felt this way" to 4="I have felt this way often"). The revised three-item scale demonstrated adequate internal consistency (a=.61). Higher scores indicate elevated perceptions of loneliness.

Demographic characteristics. Participants provided data on their age, race, sexual orientation, population of their home community, amount of distance (in miles) that their home community was from a city of 100,000 or more, and number of years they had been living with HIV disease.

Data Analysis Plan

In the current investigation, only men who self-identified as gay

or bisexual (N=125) were included in the final study sample; the 87 women and men who self-identified as heterosexual were not included in study analyses. The current study employed four data analytic strategies. First, descriptive statistics (e.g., means, percentages) were calculated for individual items of the DASS-21 and used to characterize levels of psychological distress among study participants. Second, using a series of one-sample t-tests, mean levels of depression, anxiety, and stress among gay and, separately, bisexual men were compared to subscale norms on DASS-21 subscales based on a reference group of individuals who did not meet diagnostic criteria on the DSM-IV. Third, descriptive statistics were used to summarize individual items of the Revised UCLA Loneliness Scale. Finally, Pearson Product Moment correlation coefficients were calculated to identify psychosocial characteristics associated with depression among HIV-infected rural MSM.

Results

Demographic Characteristics of Participants

Study participants were 104 gay-identified men and 21 men who self-identified as bisexual. On average, respondents were 39.6 years of age (sd=7.0, range=24-61). Eighty-one percent of men were White, 16% African American, and 3% were either Native American, Latino, or Mixed. Participants had been living with HIV disease for an average of 7.0 years (range=1 to 19 years). The average population of the communities in which participants lived was 20,319 residents (mdn=18,500, range=30 to 50,000). Twelve percent of respondents lived in communities with populations less than 1,000 residents, 33% lived in communities between 1,001 and 10,000 residents, 17% lived in communities of 10,001 and 25,000 residents, and 38% lived in communities between 25,001 and 50,000 residents. The average distance from participants' home community to a city of 100,000 or more was 78.1 miles (mdn=60, range=20 to 500). Forty-seven percent of participants lived between 20 and 50 miles from a city of 100,000, 29% lived 51 to 100 miles from a city of this size, and 24% lived 101 or more miles from a city of 100,000. Because this study would ask participants to read and complete a series of self-report surveys, participants were asked if they felt comfortable reading and completing surveys on their own. Almost all participants (124/125) responded in the affirmative.

Depression, Anxiety, and Stress among HIV-Infected Gay and Bisexual Men in Rural Areas

As shown in Table 1, many participants reported symptoms indicative of increased depression, anxiety, and stress. For example, when asked if they ever felt down-hearted or blue, 44% of participants said they felt this way "quite a bit" or "extremely." When asked if they were unable to become enthusiastic about anything, 31% either endorsed the response options of "quite a bit" or "extremely." Similarly, 31% of participants said they felt scared without any good reason, and 25% said they felt close to panic. When asked if they found it difficult to relax, 49% said they felt this way "quite a bit" or "extremely."

Levels of Depression, Anxiety, and Stress among Gay and Bisexual Men Living with HIV Disease in Rural Areas Compared to a Non-Clinical Reference Group

A series of one-sample t-tests were conducted to compare levels of psychological distress among HIV-infected gay and,

Table 1: Responses to Individual Items of the Depression-Anxiety-Stress-21 Scale.

	Not at all	Moderately	Quite a bit	Extremely
Depression				
I felt down-hearted and blue	14%	42%	29%	15%
I felt that I had nothing to look forward to	32%	38%	20%	10%
I was unable to become enthusiastic about anything	29%	40%	20%	11%
Anxiety				
I was aware of dryness of my mouth	32%	23%	30%	15%
I was scared without any good reason	43%	26%	20%	11%
I felt I was close to panic	41%	34%	19%	6%
Stress				
I found it difficult to relax	18%	33%	30%	19%
I found it hard to wind down	18%	36%	28%	18%
I found myself getting agitated	14%	34%	36%	16%

separately, bisexual MSM in rural areas to scale norms based on a reference group of non-clinical volunteers (NCVs) in previous research examining the DASS-21 (Antony et al., 1998). Non-clinical volunteers were persons who completed the DASS-21 but failed to meet any diagnostic criteria on the DSM-IV.

As shown in Table 2, gay men reported significantly higher levels of psychological distress compared to the group of NCVs. Gay-identified rural MSM reported significantly increased depression (M=1.09) compared to the reference group of NCVs (M=0.2), $t(101)$=13.6, $p < .001$. Similarly, gay men reported significantly more anxiety (M=0.96) than the group of NCVs (M=0.1), $t(102)$=13.9, $p < .001$ and also reported significantly more stress (M=1.35) than NCVs (M=0.3), $t(101)$=16.2, $p < .001$.

Bisexual rural MSM also reported significantly more psychological distress than the reference group of NCVs. Bisexual men reported higher levels of depression (M=1.22) than NCVs (M=0.2), $t(20)$=6.4, $p < .001$. In addition, bisexual rural MSM reported significantly more anxiety (M=1.1) than NCVs (M=0.1), $t(20)$=6.7, $p < .001$ and also more stress (M=1.37) than NCVs (M=0.3), $t(20)$=7.3, $p < .001$. Independent group t-tests found no differences between gay and bisexual men on measures of depression, anxiety, and stress (all $ps > .10$).

Perceptions and Comparisons of Loneliness among HIV-Infected Gay and Bisexual Men in Rural Areas

As shown in Table 3, many HIV-infected gay and bisexual men in rural areas reported elevated perceptions of loneliness. For example, when asked if there were people to whom they felt close, 55% of participants responded "not at all." When asked if they lacked companionship, 60% endorsed either "quite a bit" or "extremely." Finally, a one-way ANOVA revealed that rural bisexual men reported significantly more loneliness (M=8.2) than their gay counterparts (M=7.2), $F(1,123)$=3.7, $p < .05$.

Correlates of Depression among HIV-Infected Gay and Bisexual Men in Rural Areas

The study's final data analytic strategy involved identifying bivariate associations among demographic, psychological factors, and depression, as assessed by the DASS-21 Depression subscale. A series of Pearson Product-Moment correlations revealed that HIV-infected gay and bisexual rural men with elevated levels of depression were lonelier (r=.47, $p < .001$), more likely to be White (r=.17, $p < .03$), and were more likely to come from communities with smaller populations (r=-.12, $p < .09$). Depression among this group was not associated with age, number of years living with HIV infection, or sexual orientation (i.e., gay vs. bisexual men).

Discussion

Many participants in this geographically-diverse sample of HIV-infected gay and bisexual men living in rural communities provided responses indicative of increased emotional distress and poorer quality of life. Participants often indicated that they felt down-hearted or blue, believed that their life was meaningless, or thought that they weren't worth much as a person. In fact, levels of depression among this sample of HIV-infected gay and bisexual men in rural areas were five to six times greater that those found in a commu-

Table 2: Levels of Depression, Anxiety, and Stress Among Gay and Bisexual Men Living with HIV/AIDS Compared to Non-Clinical Volunteers.

Condition	Gay Men	Bisexual Men	NCVs
Depression	1.09	1.22	0.2[a]
Anxiety	0.96	1.10	0.1[a]
Stress	1.35	1.37	0.3[a]

NCVs = Non-clinical volunteers who did not meet diagnostic criteria on DSM-IV

[a] = Means of gay and bisexual men differ at $p < .05$ from mean of NCVs

Table 3: Perceptions of Loneliness Among Gay and Bisexual Men Living with HIV Disease in Rural Areas

Item	Not at all	Moderately	Quite a bit	Extremely
There are people to whom I feel close	55%	29%	14%	2%
I lack companionship	26%	14%	26%	34%
I feel isolated from others	10%	10%	43%	37%

nity sample of non-clinical volunteers. Many participants also indicated that they lived with elevated perceptions of loneliness, frequently characterizing their lives as lacking companionship and full of isolation. Correlational analyses revealed that HIV-infected MSM in rural areas who reported the highest levels of depression also reported the highest perceptions of loneliness and tended to live in very small communities.

As AIDS increases in rural communities, mental health researchers and practitioners will be called upon to develop intervention that can successfully address the life-care and mental health needs of people living with HIV/AIDS in rural communities. This task will surely prove to be difficult—but is also a critically important one—since many HIV-infected rural residents are geographically or psychologically isolated from traditional resources of social support. It is also likely that mental health support programs for HIV-infected rural residents will have to function without the collaborative efforts of mental health professionals. Mental health practitioners are often scarce in rural areas or choose not to work with HIV-affected persons for fear of being labeled "the AIDS doctor" (Smith et al., 1990).

One potential modality of intervention for HIV-infected MSM in rural areas involves the use of teleconference technology (Heckman et al., 1999; Rounds, Galinsky, & Stevens, 1991). Telephone-based mental health interventions can overcome the distances that separate HIV-infected rural residents, maximize confidentiality, enhance coping skills, and create systems of mutual support for individuals isolated by the stigma of their illness and the lack of support systems in their communities (Rounds, 1988). Rounds et al. (1991) evaluated a telephone-linked support group involving a small number of HIV infected men in rural areas. The six-session intervention was designed to increase information and social support, reduce feelings of isolation, and improve individual coping. The initial three sessions were devoted to participant introductions and personal histories, helping members understand the medical and mental health care systems, and helping participants deal with changing relationships among family and friends. The latter three sessions helped participants recognize and deal with feelings related to having AIDS, addressed safer sex practices and coping with changes in sexuality, and examined participants' existential and spiritual concerns. Study outcome data revealed that participants' obtained substantial benefit from the group experience; many also indicated that they would refer others in similar situations to the group. This modality of intervention may be particularly well-suited for HIV-infected gay and bisexual men in rural areas who may have significant concerns regarding confidentiality and privacy.

The current study has a number of limitations that warrant comment. First, although study participants were recruited from eight states, most participants were from Ohio, Virginia, Wisconsin, and Pennsylvania; the extent to which study findings generalize to other geographic areas is unclear.

Second, all study participants were recruited through AIDS service organizations and had recently enrolled in a mental health intervention. To this end, the current study may have oversampled persons experiencing acute distress and thus overestimated levels of psychological symptomatology among this group. Finally, because these data were collected during brief screening interviews, no data were collected on domains that might explain levels of distress among participants. Data regarding access to services, life stressor burden, drug and alcohol use, and socioeconomic status would have facilitated the interpretation of study findings.

In spite of these limitations, the current study contributes to the current AIDS mental health literature by delineating rates of psychological distress among gay and bisexual men living with HIV disease in small towns and rural communities. As AIDS becomes more common in rural communities, health care practitioners will be called upon to assist members of this group in their efforts to cope with the uncertainty of HIV disease and its aftermath. Because of the inherent difficulties of delivering mental health support services to geographically isolated individuals, health science researchers should begin to conceptualize, implement, and evaluate innovative mental health support services for the highly stigmatized group of HIV-infected gay and bisexual men in rural areas. It is our hope that findings from the current study can guide efforts to develop interventions intended for this growing but largely overlooked group.

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Rural and Non-Rural Adolescents' HIV/STD Sexual Risk Behaviors: Comparisons From A National Sample

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Abstract

Epidemiological surveillance reports indicate HIV/STDs are common in rural as well as non-rural areas of the United States. However, studies have not compared HIV/STD sexual risk behaviors of rural and non-rural adolescents. This analysis assessed differences in HIV/STD sexual risk behaviors and antecedent factors for HIV/STD infection of rural and non-rural adolescents. The sample consisted of 16,144 U.S. adolescents attending high school and participating in the 1997 Youth Risk Behavior Survey. Rural or non-rural designations were based on size of the county where the school was located. Items assessing six sexual risk behaviors and four antecedent factors related to HIV/STD infection were included in the analysis. Prevalence ratios and adjusted odds ratios were calculated to detect significant differences in responses to these ten items between rural and non-rural adolescents. Analyses were conducted separately for females and males.

Statistical differences were not found between rural adolescent females and non-rural adolescent females; however, rural adolescent males were more likely than non-rural adolescent males to report ever having sexual intercourse and not using a condom at last intercourse. Rural males were also more likely than non-rural males to report using alcohol/drugs at last intercourse and to report they had been taught about HIV/AIDS in school. We conclude that rural and non-rural adolescent females' sexual risk behaviors did not differ and that rural adolescent males had more sexual risk behaviors than non-rural males. Findings indicate that HIV/STD prevention programs need to target rural and non-rural adolescents, particularly rural males.

Introduction

Sexually transmitted diseases (STDs), including HIV infection are a serious health problem among United States adolescents (Eng & Butler, 1997). An estimated 15.3 million new STD infections occurred in the U.S. in 1996 with about one and one-quarter occurring among adolescents (American Social Health Association, 1998; Centers for Disease Control and Prevention [CDC], 1994). Epidemiological surveillance reports indicate STDs and HIV are common in rural as well as non-rural areas of the U.S. (CDC, 1999; Michelson, et al. 1999; Rural Center for AIDS/STD Prevention, 1996; Thomas, Lansky, Weiner, Earp, & Schoenbach, 1999; Valleroy, MacKellar, Karon, Jannsen, & Hayman, 1998). Behavioral surveillance studies have compared prevalence of HIV/STD risk behaviors between rural and non-rural adults (Anderson, Wilson, Doll, Jones, & Barker, 1999; Crosby, Yarber, & Catania, 1999; Crosby, Yarber, & Meyerson, 1999). These studies indicate that sexual risk behavior is at least as prevalent in rural areas as non-rural areas.

Previous studies suggest the possibility that prevalence of HIV/STD risk behaviors may not differ between rural and non-rural adolescents. For example, a recent analysis of data collected from the National Longitudinal Survey of Adolescent Health indicated that adolescents' reports of living in an urban or partly rural area were not associated with STD incidence (Crosby, Leichliter, & Brackbill, 2000). However, any differences or similarities of adolescent HIV/STD sexual risk behavior have not been empirically established. Given the lack of empirical data, this analysis assessed differences in HIV/STD sexual risk behaviors and antecedent factors for HIV/STD infection of rural and non-rural adolescents.

Methods

Data Collection

Data from the 1997 Youth Risk Behavior Survey (YRBS) were utilized for this analysis. The YRBS is a national school-based survey employing a three-stage cluster design yielding a national representative sample of students in grades nine through twelve. African-American and Hispanic adolescents were purposefully over-sampled. Randomly selected classrooms of students completed an 88-item questionnaire, administered by trained data collectors. Parental consent was obtained prior to survey administration. The student participation rate was 87%. All data were weighted to adjust for non-response and varying probabilities of selection. A more detailed explanation of the sampling and weighting procedures is available elsewhere (CDC, 1998).

Selection of Variables

The 1997 YRBS assessed six HIV/STD sexual risk behaviors: ever had sexual intercourse, had sexual intercourse in the past three months, number of sexual intercourse partners (ever and past three months), age of first sexual inter-

course, and condom non-use at last sexual intercourse. In addition, four antecedents of these risk behaviors were measured: used alcohol or drugs before most recent sexual intercourse, ever talked about HIV/AIDS with a parent or other adult, age difference of most recent sexual intercourse partner, and whether or not the adolescent had been taught about HIV/AIDS in school.

The Role of Antecedents

Previous research indicates that use of alcohol and/or drugs before sexual intercourse may be associated with increased sexual risk behavior of adolescents (Biglan et al. 1990; Duncan, Strycker, & Duncan, 1999; Lowry, Kann, Collins, & Kolbe, 1996; Sieving et al., 1997). Also, past research has established that adolescent-parent communication about HIV/AIDS is associated with decreased sexual risk behavior (DiClemente et al., under review; DiIorio, Kelly, & Hockenberry-Eaton, 1999; Durta, Miller, & Forehand, 1999; Miller, Levin, Whitaker, & Xiaohe, 1998; Whitaker, Miller, May, & Levin, 1999). Available evidence also suggests that females having sex with older males (two years or more) are less likely to report using condoms (Darroch, Landry, & Oslack, 1997; Miller, Clark, & Moore, 1997). The protective value of learning about HIV/AIDS in school has not been clearly established; however, this variable may provide an indication of HIV/AIDS awareness, possibly predisposing adolescents to protective behavior.

Data Analysis

Variances between female and male adolescents contribute to distinctly different profiles of sexual risk behavior (Crosby, Yarber, & Kanu, 1998; Yarber 1996). Consequently, all analyses were conducted separately by gender. Continuous measures (age at first sexual intercourse, number of sexual intercourse partners) were dichotomized by performing median splits. For females, a dichotomous variable was created that indicated whether or not her most recent sex partner was at least two years older than her.

Prevalence ratios were calculated to determine differences between rural and non-rural adolescents' reports for each of six sexual risk behaviors and each of four antecedents of these risk behaviors. To control for demographic influences, adjusted odds ratios were calculated using race/ethnicity, age, grade, and parents' education level as covariates. Acceptance of significance was based on an alpha level of .05 or less.

Characteristics of the Sample

The sample consisted of 16,144 adolescents. Usable surveys were obtained from 8,063 urban adolescents, 6,573 suburban adolescents and 1,518 rural adolescents. For this analysis, we defined urban and suburban adolescents as non- rural. Rural or non-rural designations were based on size of the county where the school was located. Designations were made by the Centers for Disease Control and Prevention. Table 1 indicates demographic characteristics of the sample by rural and non-rural residence.

Table 1. Demographics of the Rural and Non-Rural Adolescent Sample (N = 16,144)

Characteristic	% (n) Rural	% (n) Non-Rural
Age		
less than 17 years	56 (856)	56 (8258)
17 years or older	44 (659)	44 (6363)
Gender		
female	50 (766)	51 (7429)
male	50 (752)	49 (7197)
Race/ethnicity		
African-American	32 (482)	28 (4073)
Caucasian	58 (884)	31 (4570)
Hispanic	5 (80)	30 (4464)
Asian	1 (14)	4 (625)
American Indian/Alaskan native	1 (21)	1 (118)
Other	2 (31)	5 (664)
Grade in school		
9	27 (406)	23 (3407)
10	23 (356)	24 (3506)
11	23 (345)	25 (3723)
12	27 (410)	27 (3973)

Notes: Column percentages do not always equal 100 due to rounding.

Results

Table 2 displays the percent of rural and the percent of non-rural adolescent females reporting each of the sexual risk behaviors and antecedents. Prevalence ratios and adjusted odds ratios, reported with their respective 95% confidence intervals, are also displayed in Table 2.

Rural adolescent females did not differ from non-rural adolescent females for any of the sexual risk behaviors or antecedents. Although bivariate analyses showed that rural females were more likely to initiate sex before age 15, this difference did not remain statistically significant after controlling for sociodemographic differences, i.e., race/ethnicity, age, grade, and parents' education level.

Table 3 displays the percent of rural and the percent of non-rural adolescent males reporting each of the sexual risk behaviors and antecedents. Prevalence ratios and adjusted odds ratios, reported with their respective 95% confidence intervals, are also displayed in Table 3.

Unlike females, significant differences between rural and non-rural adolescent males were observed. Rural adolescent males were more likely than their non-rural peers to report ever having had sexual intercourse, to report non-condom use at last sexual intercourse, and to report use of alcohol/drugs before last sexual intercourse. Conversely, rural adolescent males were more likely than non-rural adolescent males to report receiving HIV/AIDS instruction in school.

Discussion

Stratified analyses revealed few differences in the prevalence of sexual risk behaviors between rural and non-rural adolescent females. For males, however, significant differences were observed. Rural males had a higher prevalence of sexual risk behaviors relative to non-rural males. Rural adolescent males were more likely to report ever having had sexual intercourse and to not use condoms during last intercourse. Thus, rural adolescents' risk behaviors for HIV/STD infection are at least as high as risk behaviors of non-rural adolescents.

Analyses also revealed few differences between rural and non-rural adolescents for the antecedents to HIV/STD risk behavior. The exceptions were that rural adolescent males were more likely to report alcohol/drug use before their last sexual intercourse and more likely to report they had been taught about HIV/AIDS in school. The latter finding was unexpected in that adolescents exposed to school HIV/AIDS education supposedly would practice less risky behavior.

This analysis contributes to the HIV/STD prevention literature by extending findings from previous adult samples to a nationally representative sample of U.S. adolescents. The slight differences established in this analysis parallel previous findings indicating that rural adults are slightly more likely than non-rural adults to report risky behaviors (Anderson et al., 1999; Crosby et al., 1999; Crosby et al., 1999; Feinleib & Michael, 1998).

Our results also indicated that levels of HIV/STD risk among both rural and non-rural adolescents of this analysis were substantial. For example, of adolescents who reported having had sexual intercourse in the past three months, about one-eighth of the females and one-quarter of the males reported two or more sexual intercourse partners during this time period. About one-third of all adolescents reported having had four or more sexual intercourse partners since their sexual debut. Given that condom use was not highly prevalent, these multiple partnerships magnify adolescents' risk of HIV/STD infection. Many of the females who had sexual intercourse before age 15 are particularly at high risk for HIV/STD because of social and biological factors (Berman & Hein, 1999).

Limitations

Findings are limited in that adolescents not attending high school were not represented in the sample. Findings are also limited by the validity of the self-reported data. Underreporting and/or over-reporting may have occurred; however, the extent to which this bias occurred differentially between rural and non-rural adolescents is unknown. In addition, findings are limited by the lack of data representing socioeconomic status, a potentially important covariate not assessed in the YRBS.

Implications for Prevention

Although HIV/STD prevention education programs have largely focused on urban adolescents, our findings clearly suggest that rural adolescents, particularly males, should also be targeted for intensive HIV prevention education designed to promote safer sex behaviors. Studies of rural adolescents' HIV/STD prevention needs and at least one successful safer sex intervention for rural adolescents have been published (Blinn-Pike, 1999; Yarber & Crosby, 1997; Yarber & Sanders, 1998). In addition, skill-based safer sex interventions found successful with non-rural adolescents (see Jemmott, Jemmott, & Fong, 1998; Jemmott & Jemmott, 2000; Stanton et al. 1996; St. Lawrence et al., 1995) may be tailored to meet the unique needs of rural adolescents.

Future research should expand the knowledge base about correlates of rural adolescents' HIV/STD risk behaviors. These correlates should include constructs not assessed in the YRBS, such as family dynamics and communication with sex partners. Identification of correlates such as these will help prevention specialists tailor intervention programs to the unique needs of rural adolescents.

Table 2. Prevalence Ratios (PR) And Adjusted Odds Ratios (OR) Indicating Associations Between Rural/Non-Rural Residence And Selected Risk Behaviors/Antecedents, Based On A Sample Of U.S. Females Attending High School (N = 8,195)

Reported Experience	Rural % (n)	Non-rural % (n)	Prevalence Ratio PR	95% CI[1]	Logistic Regression OR[2]	95% CI
Ever had sexual intercourse	48.9 (534)	46.5 (2912)	1.05	0.98-1.12	0.99	0.86-1.13
First sexual intercourse occurred before age 15	42.2 (225)	48.4 (1404)	0.87*	0.79-0.97	0.94	0.76-1.16
Had sexual intercourse with at least four partners	2 8.7 (153)	30.0 (865)	0.96	0.83-1.11	0.83	0.67-1.03
More than 1 sexual intercourse partner, past 3 months[3]	12.1 (65)	14.2 (413)	0.85	0.67-1.09	0.78	0.59-1.04
Non-condom use, last sexual intercourse experience	53.1 (280)	54.2 (1556)	0.98	0.90-1.07	0.94	0.77-1.14
Last sexual intercourse partner was at least 2 years older	9.7 (221)	8.2 (1103)	1.13	0.99-1.29	1.18	0.99-1.40
Used alcohol/drugs, before last sexual intercourse experience	17.5 (93)	20.6 (600)	0.85	0.70-1.04	0.82	0.64-1.05
Have not been taught about HIV/AIDS in school	7.6 (83)	8.9 (558)	0.85	0.68-1.06	0.88	0.69-1.13
Have not talked about HIV/AIDS with parent or adult	30 (328)	33.1 (2064)	0.91	0.83-1.00	0.88	0.76-1.01

1. Confidence interval. *Confidence intervals excluding 1.00 are significant at P < .05.
2. Odds ratios were adjusted for sociodemographic differences between rural and non-rural adolescents.
3. Percent is based on the denominators of 415 rural females and 2,212 non-rural females reporting sex in the past 3 months.

Table 3. Prevalence Ratios (PR) And Adjusted Odds Ratios (OR) Indicating Associations Between Rural/Non-Rural Residence And Selected Risk Behaviors/Antecedents, Based On A Sample Of U.S. Males Attending High School (N = 7,949)

Reported Experience	Rural % (n)	Non-rural % (n)	Prevalence Ratio PR	95% CI[1]	Logistic Regression OR[2]	95% CI
Ever had sexual intercourse	54.9 (656)	46.8 (3473)	1.17*	1.11-1.24	1.29*	1.13-1.47
First sex intercourse occurred before age 15	49.4 (323)	53.9 (1867)	0.92	0.84-1.00	0.90	0.75-1.09
Had sexual intercourse with at least four partners	34.1 (223)	36.8 (1271)	0.93	0.83-1.04	0.94	0.78-1.13
More than 1 sexual intercourse partner, past 3 months[3]	25.5 (167)	23.3 (806)	1.10	0.95-1.27	1.21	0.99-1.48
Non-condom use, last sexual intercourse experience	40.4 (261)	34.4 (1176)	1.17*	1.06-1.30	1.25*	1.05-1.49
Used alcohol/drugs, last sexual intercourse experience	31.7 (207)	27.6 (954)	1.15*	1.01-1.30	1.25*	1.04-1.51
Have not been taught about HIV/AIDS in school	6.2 (74)	8.9 (654)	0.70*	0.55-0.88	0.70*	0.54-0.90
Have not talked about HIV/AIDS with parent or adult	42.6 (509)	40.5 (2985)	1.05	0.98-1.13	1.13	0.99-1.28

* Confidence intervals excluding 1.00 are significant at P < .05.
1. Confidence interval

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Family Physicians' Knowledge, Attitudes, and Practices Regarding HIV/AIDS Prevention

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Introduction

In nearly two decades after identification of the first case of acquired immunodeficiency syndrome (AIDS) in 1981, human immunodeficiency virus (HIV) and AIDS have become a major health problem that threatens human lives (Torabi & Jeng, 1999). Due to medical progress, AIDS specific deaths have declined (Centers for Disease Control and Prevention [CDC], 1998). However, more and more people are living with HIV and spreading the disease (Fan, 1993; Key, 1998). HIV transmission is so fast that about 40,000 new cases are predicted to occur each year (CDC, 1998).

Since AIDS treatment is neither effective nor efficient, the public's knowledge and attitudes play an important role in HIV/AIDS prevention. Nevertheless, a study shows that a considerable amount of Indiana residents have misconceptions or lack knowledge about HIV/AIDS (Torabi & Ahua, 1998). Another longitudinal study reveals the public's knowledge of HIV/AIDS has declined from 1996 to 1998 (Torabi & Jeng, 1999). As a result, physicians' knowledge and attitudes play a significant role in HIV/AIDS prevention, education/counseling, and treatment for four reasons when most Americans visit a physician at least twice a year (Selwyn, 1998). First, their profession can be considered as a reliable source of HIV/AIDS information as less people believe the information and advice provided by federal government agencies (Huffman, 1999; McMurchie, 1993; Torabi & Jeng, 1999). Family physicians should become role models and provide leadership (Gabel, Crane, & Ostrow, 1994). Second, they are often the first to find evidence of serious health problems (Bronstein & Morrisey, 1991). Physicians' knowledge and attitudes play a role in having HIV/AIDS patients diagnosed in the early stages of the disease (McMurchie, 1993). Third, patients prefer to be treated within their community and knowledgeable physicians can offer early interventions (McMurchie, 1993). Lastly, positive attitudes and knowledge help physicians with the psychosocial management of individuals with HIV/AIDS in supporting those close to the patient and in educating the community in general (McMurchie, 1993).

Due to the increasing number of HIV/AIDS cases, family physicians should become more active and prepared in the prevention and care of HIV-infection (Brandon, 1999; Gabel et al., 1994; Parra, 1997). A national survey conducted. Brandon (1999) shows more than 60 percent of family physicians have received training on this subject and 70 percent have cared for at least one HIV-infected patient in the previous six months. A similar study finds 57 percent of family physicians provide medical care for HIV-positive patients (Gleeson, Havron, & Wadland, 1994). Although most physicians believe that HIV prevention is important and that physicians should play an important role in HIV/AIDS education, only a few have this kind of positive educational behavior or they provide HIV preventive services at rates far below recommended guidelines (Calabrese, Kelly, Cullen, & Locker, 1991; Millstein, Igra, & Gans, 1996). Evidence has shown that some physicians, especially in rural areas, are either insufficient in HIV/AIDS knowledge or unwilling to treat based on their moral judgments (Heckman et al., 1998; Shernoff, 1997). Family physicians perform HIV risk determination less often than experts advise and only 9 to 36 percent provide patient education to reduce risk, including abstinence, mutual monogamy, and limiting sexual partners (Carney & Ward, 1998). Many family physicians are uncomfortable with patients who are at risk for becoming infected with HIV or who are HIV-infected (Gabel et al., 1994). Even most experienced physicians sometimes exhibit discomfort or difficulty when discussing sexuality and substance-use behaviors with their patients (Epstein et al., 1998; Selwyn, 1998). Studies reveal that recent medical school graduates or female physicians feel more comfortable with people with HIV/AIDS, discuss these topics with a higher percentage of patients, and deliver higher levels of preventive services (Haas & Coe, 1997; Millstein et al., 1996).

The epidemic of HIV/AIDS first became apparent in urban areas and is increasing rapidly in rural America (National Rural Health Association, 1997). Rural as well as inner-city populations are currently under-served regarding medical services available to patients. Patient education for fatal diseases such as AIDS is usually lacking in these areas. It is important to investigate physicians from both rural and urban areas. This study sought to identify the level of HIV/AIDS knowledge, attitudes, and practices of family physicians who may encounter a patient who has, or potentially will have, HIV/AIDS. Identifying the level of patient education and prevention provided by rural physicians is critical to decreasing the rate of premature deaths by patients who are infected or may acquire AIDS related diseases.

Methodology

Design and Sampling

This study utilized a cross-sectional survey design. Five hundred rural and urban family physicians were systematically selected from the Indiana State Medical Association membership directory. Family physicians located in predetermined urban and rural settings were identified for the survey target. A rural county was identified as a county with a population of less than 50,000 people. An urban county was classified as a county with more than 50,000 people. Further, county classification into rural and urban utilized the percentage of rural and urban residents. Those rural counties classified as 65% rural and those urban counties identified as 70% urban were used in the survey target selection. A total of 250 physicians from rural and 250 physicians from urban areas were identified by systematic sampling methods. A total of 26 rural counties were selected with 70% rural status and 9 rural counties were used with 65% status. A total of 35 rural counties were selected. Up to twelve family physicians on the lists of those identified in each chosen county were selected to survey. Urban counties selected for study were additionally rated as being 70% urban. There were a total of seven urban counties examined. Up to 40 family physicians on the lists were selected from each of the seven urban counties for a total of 250 family physicians.

To achieve the desired number of counties within each area, those counties with more than 12 (in rural counties) and 40 (in urban counties) family physicians were used to compensate for the counties who lacked the required number. Family physicians were selected to be surveyed primarily because the researchers wanted to limit the survey response to those most commonly practicing medicine.

Instrument

A two-sided one-sheet questionnaire on family physicians' knowledge, attitudes, and practices regarding HIV/AIDS prevention was mailed to all subjects with a self-addressed stamped envelope. There were 5 demographic questions, 10 knowledge questions, 15 attitude questions, and 6 practice questions. Demographic questions included specialty, years in practice, geographic setting, gender, and ethnicity. Questions about HIV/AIDS knowledge and attitude were derived from McDaniel and Carlson's study in 1995. Ten truth-false knowledge questions were about transmission, contagion, epidemiology, and medical treatment of HIV and AIDS. Fifteen attitudinal questions were five-point Likert type, ranging from "strongly agree," "agree," "no opinion," "disagree," to "strongly disagree." Six practice questions asked how often the subjects dealt with different situations regarding HIV/AIDS with four response choices of "never," "rarely," "sometimes," and "regularly."

Data Analysis

The data were manually entered into the computer. The Statistical Package for Social Science (SPSS) was utilized to analyze the data. In addition to descriptive statistics, the data were subjected to analysis of variance (ANOVA) as well as chi-square for statistical test of significance. Evidence of reliability for all three parts of the instrument was provided by using Cronbach alpha method. An overall knowledge score was computed for each respondent by giving one point for each of the knowledge items that was answered correctly. After converting negative statements, an overall attitude score was calculated for each respondent by assigning one point for "strongly disagree" through five points for "strongly agree" (McDaniel & Carlson, 1995).

Findings

Although follow-up mailings were sent to subjects twice after the original surveys were mailed, only 144 physicians completed and returned their questionnaires which constituted a response rate of 29%. The low return rate was consistent with other surveys using physicians as subjects (Lam, Le, Crawford, & Patel, 1999; Leaming, 1998; McGuckin & Kerstein, 1998; Mebane, Oman, Kroonen, & Goldstein, 1999). The Cronbach alpha reliability coefficients were .44 for the knowledge section, .76 for the attitude section, and .84 for the practice segment. According to the demographic background of the respondents, about 15% were females and 85% were males. About 19% of the respondents were practicing in urban areas, 29% in suburban, and 52% in rural. Near 30% of the physicians had practiced ten years or less, 36% had 11 to 20 years of practice experiences, 14% had 21 to 30 years of practice, and 20% had experiences of 31 or more years.

Knowledge

Respondents' mean score on the knowledge scale was 6.7 (SD=1.8) out of a possible score of 10. Ninety-five percent confidence interval of knowledge mean score for population was 6.4 to 7.0. The percentages of correct answers to all knowledge questions for family physicians in this study and medical students in McDaniel and Carlson's study are shown in Table 1. Only 36% of the physicians answered correctly on the question related to central nervous system involvement in AIDS. Four questions (regarding AZT prophylaxis, healthcare workers with needle stick injuries, new AIDS cases in minorities, and HIV transmission to new born infants) were answered correctly by only about 60% of the respondents.

Analysis of variance (ANOVA) indicated no significant difference regarding HIV/AIDS knowledge among sub-

Table 1: Comparing Physicians' Answers with Medical Students' Answers to Knowledge Questions Regarding HIV/AIDS Prevention.

Knowledge Questions	% Correct		Key[b]
	Family Physicians	Medical Students[a]	
There is a spectrum of disease associated with HIV infection.	99.3	98.4	T
On average, the time for exposure to HIV to the development of AIDS is 7-8 years.	80.1	79.4	T
The CDC recommends AZT prophylaxis for patients with 500 T-cells.	55.2	76.2	T
The seroconversion rate for healthcare workers with needle stick injuries is 0.3%.	60.3	73.4	T
Recurrent vaginal yeast infections and cervical cancer can indicate AIDS in women.	77.0	58.7	T
Serologic tests that diagnose infection with HIV are generally positive within 12 weeks of infection.	67.9	79.4	T
Over 50% of new AIDS cases occur in minorities.	62.0	56.5	T
A newborn infant born to an HIV positive mother has a 60% chance of being HIV positive.	59.9	33.3	T
The fastest growing risk group for acquiring HIV infection is homosexual and bisexual men.	81.0	95.2	F
Central nervous system involvement occurs in less than 40% of patients with full blown AIDS.	36.0	54.8	F

a. Data were derived from McDaniel & Carlson (1995).
b. Key answers to knowledge questions: "T" for true and "F" for false.

groups. When knowledge scores were tested by urban, suburban, and rural setting, physicians showed no significant difference (F=.08, p<.92). Female respondents had a little higher knowledge mean score ($\overline{X}$=7.1) than males ($\overline{X}$=6.8), but its difference was not statistically significant (F=.38, p<.54). Physicians who had practiced more than 30 years had a lower knowledge mean score ($\overline{X}$=6.0) than those who practiced 10 years or less ($\overline{X}$=7.0), from 11 to 20 years ($\overline{X}$=7.0), or from 21 to 30 years ($\overline{X}$=6.9). However, the difference was, again, not significant (F=2.11, p<.11).

Attitudes

The result of family physicians' HIV/AIDS attitude survey showed a mean score of 56.0 with a standard deviation of 6.8. Ninety-five percent confidence interval of attitude mean score for the population was 59.4 to 57.1. The distribution of responses on all attitude questions for family physicians and medical students are shown and compared in Table 2. The majority of physicians agreed or strongly agreed on the following statements: feeling comfortable about HIV counseling (86.1% of respondents), promoting condom use for HIV prevention (82.4%), talking with patients about safer sex (86%), feeling comfortable about taking patients' sexual history (73.7%), feeling comfortable about taking patients' drug-use history (90.5%), feeling comfortable about patients' concern about being infected (97.8%), and feeling comfortable about social contact with HIV infected people (81.8%). On the other hand, some physicians disagreed or strongly disagreed with the following statements: homosexuality being a broad range of normal behavior (42.3% were negative), no different feeling about patients with or without HIV (24.8%), feeling comfortable about physical contact with HIV patients (14.6%), demonstrating putting a condom on a model (14.7%), willing to treat a person with HIV (16.9%), and willing to refer HIV patients to another physician (42.9%). Also, more than one third of the physicians agreed or strongly agreed with mandating an HIV test for all hospital employees (35.8%) and for all patients admitted to the hospital (34.3%).

ANOVA tests showed no significant difference in physicians' attitude scores among three settings (F=1.71, p<.19). However, Figure 1 presents a significant difference of family physicians' attitude scores by gender (F=6.28, p<.02). Female physicians had a higher attitude score ($\overline{X}$=59.6) than male physicians ($\overline{X}$=55.3). Besides, the significant difference of family physicians' attitude scores by years of practice is shown in Figure 2 (F=3.43, p<.02). Generally speaking, total attitude scores decreased when years of practice increased, ranging from a mean score of 58.2 for 10 or fewer years to a mean score of 53.4 for more than 30 years.

Practices

Table 3 shows family physicians' responses to all practice questions regarding HIV/AIDS prevention. About 40% of the

Table 2: Comparing Physicians' Answers with Medical Students' Answers to Attitude Questions Regarding HIV/AIDS Prevention.

Attitude Questions	Responses (%)		
	Agree/ strongly agree	No opinion	Disagree/ strongly disagree
I feel comfortable counseling a patient on methods to prevent HIV transmission during sex.			
- Family physicians	86.8	8.3	4.9
- Medical students [a]	87	6	6
I believe that there is a broad range of normal sexual behavior and that homosexuality falls within this range.			
- Family physicians	43.8	14.6	41.7
- Medical students	56	11	33
I would feel no difference about patients with or without HIV infection.			
- Family physicians	65.3	9.7	25.0
- Medical students	64	11	25
In my role as a healthcare provider, I feel comfortable with physical contact with patients with HIV infection.			
- Family physicians	79.2	6.3	14.6
- Medical students	68	10	22
I approve of the educational emphases on condom use for HIV prevention.			
- Family physicians	83.2	4.9	11.9
- Medical students	94	5	2
I can talk openly with my patients about safer sex.			
- Family physicians	86.7	11.9	1.4
- Medical students	83	11	6
I would feel comfortable taking a detailed sexual history from a patient.			
- Family physicians	75.0	16.0	9.0
- Medical students	75	13	13
Using a model, I can demonstrate the technique for putting on a condom.			
- Family physicians	66.4	18.9	14.7
- Medical students	83	10	8
I would feel comfortable taking a drug use history from a patient.			
- Family physicians	90.9	7.7	1.4
- Medical students	87	5	8
I am comfortable having patients express concern of being infected with HIV.			
- Family physicians	97.9	2.1	0.0
- Medical students	100	0	0
I would not treat a person with HIV.			
- Family physicians	16.1	16.1	67.9
- Medical students	0	5	95
If I could refer a patient with HIV to another physician without risk of professional recrimination, I would.			
- Family physicians	38.6	17.9	43.6
- Medical students	12	26	62
All hospital employees should be tested for HIV.			
- Family physicians	36.8	20.8	42.4
- Medical students	65 [b]	66 [b]	11 [b]
All patients admitted to the hospital should be tested for HIV.			
- Family physicians	35.4	22.2	42.4
- Medical students	35	18	47
I am comfortable coming into social contact with people having HIV infection.			
- Family physicians	81.9	9.0	9.1
- Medical students	77	19	3

a. Data were derived from McDaniel & Carlson (1995).

b. Total percentage exceeds 100% as reported by the original manuscript of McDaniel & Carlson (1995).

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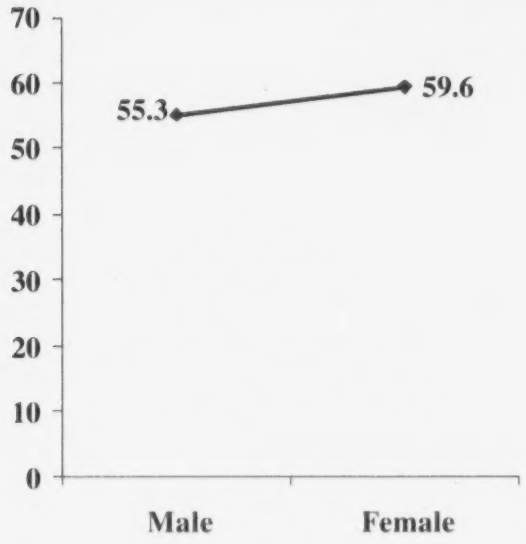
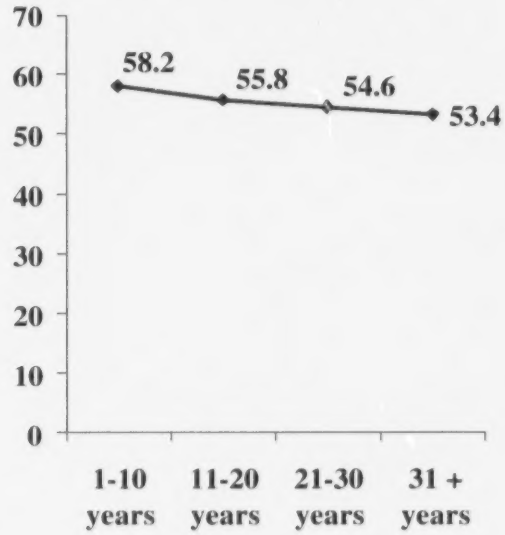
Figure 1: Physicians' Attitude Scores by Gender



F (1, 119) = 6.28, p < .02

Figure 2: Physicians' HIV/AIDS Attitude Scores by Years of Practice:



F (3, 135) = 3.43, p < .02

Table 3: Physicians' Answers to Practice Questions Regarding HIV/AIDS Prevention.

Practice Questions	Responses (%)			
	Never	Rarely	Some-times	Regu-larly
How often do patients ask you questions concerning HIV/AIDS?	2.8	35.4	56.9	4.9
How often do you query patients concerning risk factors for HIV/AIDS?	2.1	19.4	55.6	22.9
How often do you discuss HIV risk factor reduction with patients?	2.1	21.5	57.6	18.8
How often do you discuss HIV/AIDS risk factors with patients?	2.1	25.2	55.9	16.8
Physicians should be involved in HIV/AIDS education & prevention?	0.7	0.7	23.6	75.0
I talk comfortably to patients about HIV/AIDS modes of transmission.	0.7	1.4	35.4	62.5

participants had patients that never or seldom asked questions concerning HIV/AIDS. More than one-fifth of the physicians (22.6%) never or seldom queried their patients concerning risk factors for HIV/AIDS, such as sexual orientation, intravenous drug use, promiscuous behavior, blood transfusions, etc. Nearly one-fourth (24.8%) never or seldom discussed HIV risk factor reduction, i.e., condom use, abstinence, needle sharing, etc., with patients. About 29% never or seldom discussed HIV/AIDS risk factors with patients. Almost all participants (98.5%) believed that physicians should be sometimes or regularly involved in patient education with regard to HIV/AIDS prevention. In addition, almost all participants (97.8%) sometimes or regularly felt comfortable talking to patients about modes of transmission for HIV/AIDS.

Chi-square tests showed that none of the practice questions had significantly different responses in different settings. The distribution of physicians' self-reported practices regarding HIV/AIDS prevention by gender was analyzed and those practices that significantly related to gender are presented in Table 4. As Table 4 shows, female physicians were more often to query their patients concerning risk factors for HIV/AIDS (X^2=6.4, p<.05), to discuss HIV risk factor reduction with their

patients (X^2=7.3, p<.01), to discuss HIV/AIDS risk factors with their patients (X^2=8.5, p<.01), to agree regarding physicians' involvement in HIV/AIDS education (X^2=4.2, p<.05), and to feel comfortable talking about modes of transmission (X^2=6.2, p<.05) than their male counterparts.

The distribution of physicians' self-reported practices with regard to HIV/AIDS prevention by physicians' practice years was also analyzed and those practices that significantly related to physicians' years of experience are presented in Table 5. As Table 5 shows, those with fewer practice years were more often to have patients ask questions concerning HIV/AIDS (X^2=14.3, p<.01), to query their patients concerning risk factors for HIV/AIDS (X^2=13.7, p<.01), and to discuss HIV risk factor reduction with patients (X^2=13.0, p<.01) than their more experienced counterparts.

Discussion

This study addressed family physicians' knowledge, attitudes, and practices regarding HIV/AIDS. While the reliability coefficients for the attitude and practice components of the instrument used in this study were reasonably acceptable, the coefficient was low for the knowledge section. The low reliability coefficient for knowledge was expected since the test was designed not as a norm-reference but a criterion-reference test. Generally speaking, physicians' mean knowledge score (6.7 out of possible 10) was considered relatively low, compared to medical students' (6.25) (McDaniel & Carlson, 1995). Physicians' misconceptions were mostly related to the central nervous system, AZT prophylaxis, healthcare workers' needle stick injuries, new AIDS cases in minorities, and HIV transmission to newborn infants. Some physicians lacked positive attitudes toward homosexuality being normal behavior, patients with HIV, physical contact with HIV patients, demonstrating using a condom, treating a person with HIV, and referring HIV patients to another physician. These attitude factors might have a negative impact on their willingness to care for patients with HIV/AIDS. Moreover, some physicians lacked the practice of being asked HIV/AIDS questions by their patients, querying their patients concerning risk factors for HIV/AIDS, discussing HIV risk factor reduction, or discussing HIV/AIDS risk factors with patients. Although physicians' HIV/AIDS knowledge was homogeneous no matter what their geographic settings, gender, or years of practice were, their attitudes and practices differed significantly according to their gender and years of practice, but not their geographic setting. Results of this survey revealed female and less experienced physicians had more positive attitudes and better practices regarding HIV/AIDS.

Conclusions and Recommendations

Even in the second decade of the AIDS pandemic, some family physicians still have poor knowledge, attitudes, and practices regarding HIV/AIDS. Findings imply the need to further educate those family physicians who have been in practice for more than 30 years. Perhaps because HIV/AIDS has only surfaced in the past two decades, physicians in smaller rural communities may be unfamiliar with all the facts about the HIV virus and AIDS.

Response rates for surveying physicians are typically low due to their busy clinical practices and increasing telecommunication and telemarketing surveys (Halm, Causino, & Blumenthal, 1997; Mebane et al., 1999). This study is no exception. Thus, findings from this study should be interpreted in light of this limitation and may not be generalized to all physicians in the urban and rural communities of

Table 4: Physicians' Answers to Practice Questions with Significant Difference in Genders.

Practice Questions	Gender (n)		X^2
	Male	Female	
How often do you query patients concerning risk factors for HIV/AIDS?			
- Never or rarely	27	0	6.4
- Sometimes or regularly	75	18	
How often do you discuss HIV risk factor reduction with patients?			
- Never or rarely	31	0	7.3
- Sometimes or regularly	72	18	
How often do you discuss HIV/AIDS risk factors with patients?			
- Never or rarely	36	0	8.5
- Sometimes or regularly	67	17	
Physicians should be involved in HIV/AIDS education & prevention?			
- Never or rarely	29	1	4.2
- Sometimes or regularly	74	17	
I talk comfortably to patients about HIV/AIDS modes of transmission.			
- Never or rarely	43	2	6.2
- Sometimes or regularly	60	16	

Table 5: Physicians' Answers to Practice Questions with Significant Difference in Practice Years.

Practice Questions	Physicians' Practice Years (n)				X^2
	1-10 years	11-20 years	21-30 years	31 + years	
How often do patients ask you questions concerning HIV/AIDS?					
- Never or rarely	15	11	14	11	14.3
- Sometimes or regularly	26	39	6	17	
How often do you query patients concerning risk factors for HIV/AIDS?					
- Never or rarely	4	7	6	12	13.7
- Sometimes or regularly	37	43	14	16	
How often do you discuss HIV risk factor reduction with patients?					
- Never or rarely	5	9	7	13	13.0
- Sometimes or regularly	36	41	13	15	

the state of Indiana. In spite of limited response rates, surveys of physicians still have described important and useful information (Cykert, Hansen, Layson, & Joines 1997; Mebane et al., 1999). This research provides additional knowledge concerning family practitioners' knowledge, attitudes, and practice of HIV/AIDS prevention. Further, the data also provide a better understanding of methods for HIV/AIDS intervention and education, possibly serving as an impetus in the examined communities for practitioner education programs.

Finally, it is recommended that family physicians' knowledge, attitudes, and practices of HIV/AIDS should be continuously investigated and its trend should be monitored. It is especially important to trace the differences of HIV/AIDS knowledge and attitudes among settings, gender, and years of practice. To monitor the trends, this study should be replicated at least every two years.

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